The Iron Age

A Review of the Hardware and Metal Trades.

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Improved Lathe Chuck.

We present herewith illustrations of Judson's Patent "Holdfast" Lathe Chuck, manufactured by David Roberts, No. 200 Wythe avenue, Brooklyn, E. D., New York. As will be seen from the cuts, this chuck is constructed on a new principle. Its special feature is the mode of working the jaws in and out. Fig. 1 represents a face view with handle inserted for setting up the jaw: Fig. 2 a side view, partly in section through one jaw. The fixed screw of each is fitted with a nut, A, of peculiar shape, moving in planed grooves. The upper portion of the nut is formed with projecting horns, which fit truly into the recessed part of the jaw, and a bolt, B, driven home makes the fixing complete. When the screw is turned by the loose handle, C, the nut travels along, carrying with it the jaw; and it will be observed that the horns of the nut are inclined planes, so that while they act to advance the jaw, they at the same time tend to force it close down on its working face, and thus the wearing of the face (which in ordinary chucks soon loosens the jaws) is provided for by the nut keeping the jaw always close to the face. The nut being held firmly in its guides, no bending strain is thrown on the screw, tending to injure the threads, as frequently is the case with ordinary chucks. The whole of the working parts are made of steel, or of tough homogeneous metal. These chucks have been in constant use for the past five years, in some of the principal machine and railroad shops in the country, and have given satisfaction.

Fig. 1.

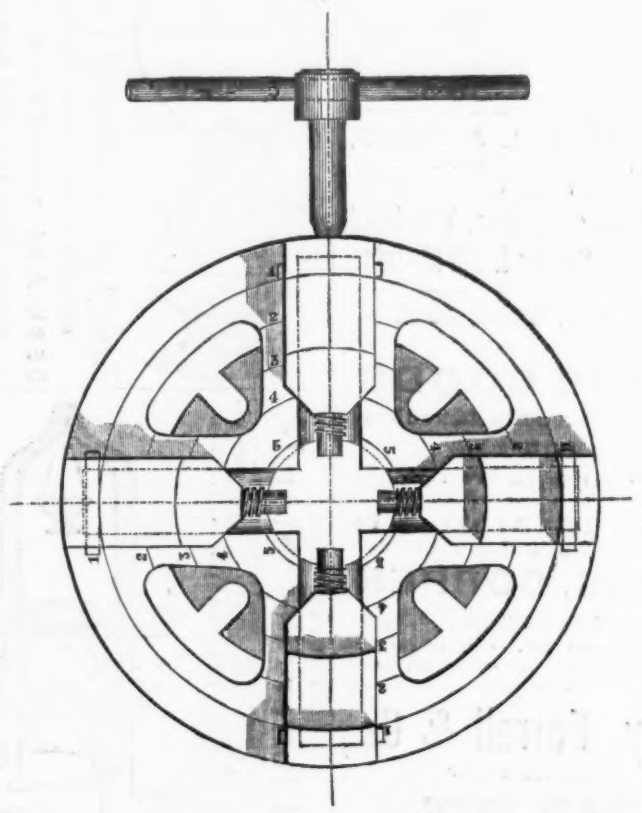
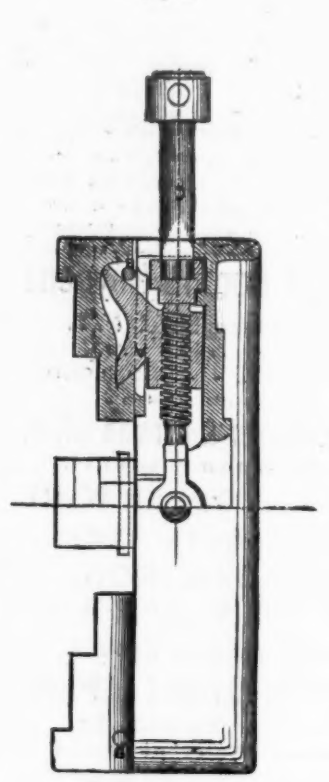


Fig. 2.



JUDSON'S PATENT "HOLDFAST" LATHE CHUCK.

Improved Boiler Flue Cleaner.

Mr. Wm. G. Pike, of Philadelphia, has invented an improved flue cleaner, shown in the accompanying illustrations. Mr. Pike is an inspector of the Hartford Steam Boiler Inspection and Insurance Company, and has had opportunity to give his device practical trial under circumstances calculated to test its efficiency. The general form of the apparatus is shown in Fig. 1. Fig. 2 shows the position of the ends of the spiral tubes in the head.

a b c are tubes, which are screwed into the head *d*. *h* is a tube that connects the head *d* with the steam. The tubes *a b c* are screwed into the head *d*, and then twisted into the spiral form, as shown in Fig. 1.

The operation of the device is as follows: The head *d* being connected to the steam-supply by the tube *h*, the ends of the tubes *a b c* are inserted into the flue or tube to be cleaned. The steam is then turned on. The tubes *a b c*, being twisted into a spiral form, cause the steam to pass through the flue or tube in a spiral course, thereby effectually removing the dirt or ashes. The invention is brought to our notice with favorable comments from those who have used it.

Fig. 1.

Fig. 2.

IMPROVED FLUE CLEANER FOR STEAM BOILERS.

Hydro-Thermic Motive Power, and its Application.

A series of inventions, closely connected with each other, have been patented by Mr. F. Tommasi, at Paris, embracing three applications of hydro-thermic motive power, the first being an improved motive power engine. This machine is composed of two or more cylinders, filled with oil or other liquid; it is set in motion by the alternate expansion and condensation of this liquid. To produce the expansion hot water or steam is made to circulate through small tubes plunging into the liquid, and to produce the condensation cold water or any other refrigerating mixture is made to pass through the same small tubes. The liquid expanding and condensing alternately drives the pistons in and out of their cylinders, thus producing a come-and-go motion, which may be transformed into a circular motion by ordinary means. If, as is preferable, hot water is used, the actual working of the machine returns to the boiler the hot water which has circulated through the small tubes, thereby giving a great saving. The distribution of the steam or hot water and of the cold water is effected by means of ordinary slide valves, set in motion by a cam, in lieu of an eccentric, in order to render the distribution almost instantaneous.

The improved hydro-thermic riveting machine, based upon the same principle, is set in motion by the alternate expansion and condensation of oil or any other liquid contained therein. To produce the expansion, hot water or steam is made to circulate in small tubes plunging into the oil or other liquid; and to produce the condensation, cold water or any other refrigerating mixture is made to circulate through the same small tubes. When the liquid is under expansion it lifts a vertical piston, which raises counterweights. The hot rivet is then placed between puncheons, one of which is stationary, and the other fixed to a horizontal piston, which, like the first-mentioned piston, also plunges into the liquid; this horizontal piston is clutched by a cam lever, but at this moment it is released (and driven by the pressure of the other piston, which is rapidly brought down by its counterweights), suddenly advances, and rivets the rivet. The cold current is then substituted for the warm one, the horizontal piston is brought back to its place, and the operation recommenced.

The third patent relates to an improved hydro-thermic punching machine, which is set in motion by the alternate expansion and condensation of oil or other liquid contained in the machine. To produce the expansion hot water or steam is made to circulate within small tubes plunging into the oil or other liquid; and to produce the condensation cold water or other refrigerating mixture is made to circulate through the same small tubes. When the liquid is under expansion it drives down a piston furnished with a punch, and thus punches the plate of metal submitted to its action. The descent of the piston also effects automatically (by means of a particular arrangement of slide valves or cocks) the substitution of the cold circulation for the hot one, which brings the piston back to its place. The return of the piston to its place substitutes the hot circulation for the cold one, the work recommences, and so on.

Protection Necessary for the German Iron and Steel Industries.

Herr Commerzienrath Baare, while declining to allow himself to be regarded as a representative of protectionist principles in the abstract, has written to the *National Zeitung* urging that the dues on iron imported into Germany ought not yet to be abolished. The discovery of Bessemer steel, says Herr Baare, has proved itself a turning point in the history of the iron industry. Prior to the introduction of the new manufacture, the German iron trade seemed to have attained that stage of development when it could afford to dispense with protective duties; but so completely is Bessemer steel driving iron from the market, that the German iron masters are one and all finding themselves compelled to convert their works for the production of the former. It will yet take some years to complete the transition, and such a period is not a suitable one for the abolition of the dues, especially as Germany's competitors as yet possess natural advantages over her. In order to produce a steel capable of competing satisfactorily in the market an ore is required as free as possible from phosphor and sulphur. England possesses this in the hematite iron districts, France in Algeria and the island of Elba, while Spain, Italy, Sweden and Austro-Hungary are also richly endowed with a suitable quality. The best ore in Germany, that found at Osnabruck, is very poor in comparison, yielding only 29 per cent. of metal, against 50 per cent. obtained from the Algerian and Elba ores. The hopes of the German iron trade rest on the efforts of German scientific men to discover a way of satisfactorily removing the sulphur from the ore, and the fortunate discovery will immediately become a millionaire. In the meantime, the German works are compelled to draw large supplies of ore from Algeria, Spain, &c. The Krupp firm, of Essen, for instance, has lately acquired extensive mines in Spain, and runs its own steamers for the transport of the material, the difficulties of the arrangement having been much increased, however, by the Spanish war. The first cost is considerably enhanced by the distance of the works from the ports, the carriage of the ore inwards, and of the manufactured article to the coast for export, being important items. Germany is obliged to export a large quantity of her surplus production, and it is in exporting steel rails to Russia that her disadvantage, as compared with England, is especially seen. The cost of carriage overland being too great, she has to forward the metals by train to the Dutch ports, from whence the freights to the Prussian ports on the Baltic and to Russia are equal to the freights from the English ports to the same destinations. Merely reckoning the cost of the outward journey, therefore, continues Herr Baare, the English have an advantage of seven thalers per ton, the cost of railway carriage to Holland. The German position has, nevertheless, improved somewhat. Originally, German manufacturers were compelled to use English hematite entirely, while at present they only require 45 per cent. of foreign ore. When the promises of science are fulfilled, Germany will be independent of external supplies of raw material, but, until that consummation, she cannot afford to dispense with protective dues.

Effect of Changes in Temperature Upon the St. Louis Bridge.

The *Railway World* says:

When Professor Tyndall published his lectures on heat, he entitled the book "Heat Considered as a Mode of Motion," setting out in the very title the idea which permeates the work, and expressing in one word the modern conception of heat. Heat is motion, the result of the motion of the molecules of all bodies, and in all its aspects is accompanied by motor phenomena often beautiful and never entirely without interest to a thinking mind.

The effects of change of temperature are, at the present day, taken in account in all engineering calculations. They determine the distance between the ends of the metals on a railroad track; necessitate the use of rollers at the end of bridge trusses when the variation in their length, produced by rise or fall of temperature, is perceptible; require the use of expansion joints in long iron gutters and the hot air pipes of a blast furnace, and have driven civil engineers at times almost to their wits' end for "compensating" contrivances.

During the erection of Southwark bridge across the Thames, at London, the structure was almost ruined for want of observing this natural law, the expansion of the cast iron of the arches under the sun's rays producing a strain upon the piers which had not entered into the engineer's calculations.

Since that time bridges have been more carefully framed with respect to thermal influences. The engineer's endeavor is to have the expansion or contraction of one part counteract the corresponding change in another part, so as to increase the stability of the whole.

It will readily be seen that the longer the span of any bridge the greater the necessity for due caution in this respect. We have here in St. Louis a bridge with arches of 500 feet; and, to any one who has the proper means of observation, the changes in the elevation of the crown of the arches are very perceptible. In the construction of the work, calculations and allowances were made for the extremes of temperature, through a range of 140°, from the greatest cold in winter to the warmest day of summer, and the calculated difference in the elevation of the center pier of the upper chord above the City Directrix at these two times was about 18 inches.

The bridge has now long been finished. During the year the hight of the center piers of the top chords of the arches above the City Directrix has been noted almost daily at temperatures which have ranged from 92° Fahrenheit to 15° Fahrenheit, the elevations being taken with a level from the abutments of the bridge.

Now let us see how the actual facts correspond with the theoretical calculation. As the spans differ but little in length, the figures for the western span will answer every purpose.

Here they are (the "hight" is that of the center pier of the top chord above the City Directrix):

Date.	Temp. 8 p. m.	Hight, in feet.
May 6th, 1874	86° F.	63·548
June 29th, 1874	77° F.	63·688
July 20th, 1874	91° F.	63·757

Those are the higher temperatures. The cold weather showed the following state of things:

Date.	Temp.	Hight, in feet
January 4th, 1875	10° F.	63·341
January 9th, 1875	15° F.	63·005

The observation of January 9th last is the last one taken.

Between the figures for July 20th last and those for January 9th, which two days are respectively the warmest and coldest of the year, there is a difference in temperature of 107° Fahrenheit, and of 0·692 feet, or nearly 8 5-16 inches.

This is an effect of temperature much less than calculated, due partly to the fact of the iron work being painted white, which lessens the absorption of heat in hot weather, and increases the radiation in cold weather, and also the protection afforded by the roof of the bridge. This latter is strikingly exemplified in the fact that the river, while frozen above and below the bridge, has yet been open under it.

At a temperature of 60° the arches assume their normal curve, all members of the two chords being in equal tension. A fall of temperature throws the center of the lower chord and the ends of the upper chord into tension, and the balance of the two chords into a state of compression, or, in other words, lowers the crown of the arch. A rise of temperature throws the center of the top chord and the ends of the bottom chord into tension, and compresses the remainder of the two chords, or, in common parlance, elevates the crown of the arch.

The position of the chords, however, is not necessarily the same on days of equal atmospheric temperature, the temperature of the iron varying several degrees from that of the air, and being affected by the amount of moisture present in that surrounding medium.

After the experience of the past nine months the engineers and officers of the Bridge Company express themselves as entirely satisfied with the behavior of the bridge through all the climatic changes of that period, which have probably been as extensive as they ever will be in this generation or the next.

Industrial Secrets.—A century ago what a man discovered in the arts he concealed. Workmen were put upon oath, never to reveal the process used by their employers. Doors were kept closed, artisans going out were searched, visitors were rigorously excluded from admission, and false operations blinded the workmen themselves. The mysteries of of every craft were hedged in by thick set fences of empirical pretentions and judicial affirmation. The royal manufactories of porcelain, for example, were carried on in Europe with a spirit of jealous exclusiveness. His Majesty of Saxony was especially circumspect. Not content with the oath of secrecy imposed upon his work people, he would not abate his kingly suspicion in favor of a brother monarch. Neither king nor king's delegate might enter the tabooed walls of Meissen. What is erroneously called the Dresden porcelain—that exquisite pottery of which the world has never seen the like—was produced for 200 years by a process so secret that neither the bribery of princes nor the garrulity of the operatives ever revealed it. Other discoveries have been less successfully guarded, fortunately for the world. The manufacture of tinware in England originated in a stolen secret. Few readers need to be informed that tinware is simply thin iron plated with tin by being dipped into the molted metal. In theory it is an easy matter to clean the surface of iron, dip it into a bath of the boiling tin and remove it enveloped with the silvery metal to a place for cooling. In practice, however, the process is one of the most difficult in the arts. It was discovered in Holland, and guarded from publicity with the utmost vigilance for nearly half a century. England tried in vain to discover the secret, until James Sherman, a Cornish miner, crossed the Channel, insinuated himself master of the secret, and brought it home. The secret of manufacturing cast steel was also stealthily obtained, and is now within the reach of all artizans.

How to Burn Coal.—A writer in the *Journal of Health* offers the following suggestions concerning the economical combustion of coal: A very common mistake is made and much fuel wasted in the manner of replenishing coal fires, both in furnaces and grates. They should be fed with a little coal at a time, and often; but servants, to save time and trouble, put on a great deal at once, the first result being that almost all the heat is absorbed by the newly put on coal, which does not give out heat until it has itself become red hot. Hence, for a while, the room is cold, but when it becomes fairly aglow the heat is insufferable. The time to replenish a coal fire is as soon as the coals begin to show ashes on their surface; then put on merely enough to show a layer of black coal covering the red. This will soon kindle, and as there is not much of it, an excess of heat will not be given out. Many almost put out the fire by stirring the grate as soon as fresh coal is put on, thus leaving all the heat in the ashes when it should be sent to the new supply of coal. The time to stir the fire is just when the new coal laid on is pretty well kindled. This method of managing a coal fire is troublesome, but it saves fuel, gives a more uniform heat, and prevents the discomfort of alterations of heat and cold above referred to.

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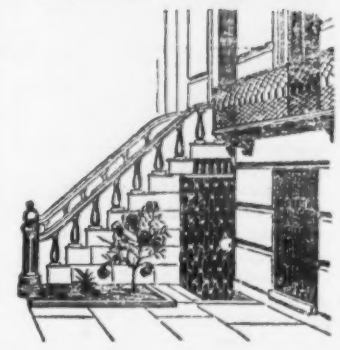

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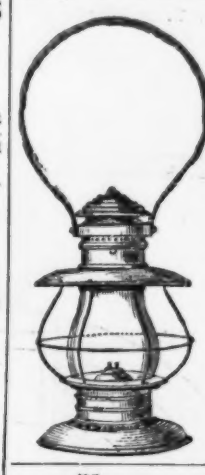

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Railway Communication Between England and the Continent.

The following is condensed from a pamphlet lately issued in France:

A company of capitalists and engineers was formed in London in February, 1872, under the style of the Channel Tunnel Company (limited), for the purpose of sinking shafts near Dover and Calais, and driving galleries under the sea sufficiently to ascertain the difficulties of extending the work under the Strait and the cost of a sub-marine railway. If these preliminaries justify the further exploration, and the completion of studies that have been costly, it is intended to appeal to the public for the necessary capital. Committees have been created in both countries to direct the preliminary work. The English committee consists of Lord Richard Grosvenor, Mr. Wm. Hawes, Fred. Beaumont, M. P., Thomas Brassey, M. P., Sir E. Buckley, M. P., and others; the French includes M. Chevalier, of the Institute; M. Bergeron, C. E., M. Blount, MM. Caillaux and Paris, deputies, &c. M. William Bellingham is the secretary. The engineers are Sir John Hawkshaw, MM. James Brunlees, and Thome de Gamond.

The company asked general approval from the governments of both countries, without seeking subvention or guaranty of interest. The English government very readily promised its moral support, but very speedily refused material aid. The French government three ago called the attention of the municipalities to the preliminary investigations at Pas-de Calais, and notified the Chamber of Commerce. A technical description of the project was required for submission to them, accompanied by an estimate of the probable consequences of such a work on the commerce, communication and general interests of both countries. M. Thome de Gamond's schemes, the result of 35 years' study and explorations, were exhibited at the Exhibition in 1867, and attracted much attention. They included submerged metallic tunnels; the construction of an elevated bridge; transportation for railway trains, &c. Sir John Hawkshaw has examined both coasts and all of the Strait, and has indicated a line by which the tunnel can be driven through a thick stratum of chalk, with the wells needed for ventilation, and pointed the most expedient approaches. The plan was contingent in detail upon the greatest depth of the Strait, that has been proved not to exceed 54 metres; so that if the Cathedral of Notre Dame were sunk at the deepest point its towers would rise 12 meters above the sea. A tunnel driven at 100 meters' depth from the level of the sea would, therefore, be protected by a roof 46 meters thick.

The possibility of this submarine work without risk of the sea breaking in, is proved by the lead and coal galleries of Cumberland and Cornwall. These are strong and secure, and miners work at great depths and far out, where they hear the rocks rolled by the waves. The numerous galleries at Whitehaven are all reliable. The director of one of the most important of the Cumberland mines has stated that that gallery traverses clay, coal, gravel, attaining 564 feet in depth, and extending 4000 yards in one direction—5200 in all, where the sea is 70 to 200 yards above the mine. Pumps have raised 489,600 gallons in 24 hours. A ventilator is used. There is no more inflow at high than at low water, and the amount infiltrated from the sea is inappreciable. In 1778 M. Pryce, an English engineer, declared that submarine galleries were protected from the sea by some impermeable gelatinous substance at the bottom of the water—instancing one that had a roof but five meters thick. All of the facts warrant a belief that the tunnel would not be liable to infiltration, as it will extend through an unbroken bed of chalk from shore to shore. It is generally held that France and England were at some former period united by an isthmus, that has been worn away by the erosion of the sea; and neither in Dover or Calais are the borings through the chalk that must have formed this connection ever accompanied by finding water. In the former place wells bored 110 feet through chalk have been abandoned because they gave no sufficient supply. Borings through green sand at Harwich, near Dover, 325 meters, did not reach water; the Calais artesian, 350 meters, failed utterly; the Paris artesians show that chalk does not admit water, and all discountenance the idea that the tunnel is liable to infiltration.

With these reasons for believing that the work can be safely prosecuted, there is the additional fact that new engineering appliances have made it more feasible. When Gamond wrote it was thought that there must be intermediate entrances, to enable the prosecution of the work at different stages simultaneously, and he considered schemes to allow this. Sommeiller's machinery at Mont Cenis and that of Favre at Saint Gothard cut through the masses of granite, quartz, gneiss and schiste without this assistance, and can more readily dispose of the chalk and soft soil of the channel untalled. The boring machine of M. Brunton, however, is particularly adapted to this work. It is worked either by steam or compressed air; will cut a section more than two meters in diameter; pulverize the material; deposit it on an endless cloth moved by the same motor and deposit it in cars at the entrance, to be removed. The English engineers recommend this invention highly, from their own experience. Tried near Rochester, it advanced from one meter to a meter and a quarter each hour, and at this rate would penetrate the distance from Calais to Dover, sufficiently for a reconnoissance, within two years. An approximate estimate of cost for this gallery is 20,000,000f. or £800,000 sterling; and this accomplished, renders the tunnel itself a certain success. The gallery could be enlarged in four years; connected with the French and English railways, and finished at a gross cost of 100,000,000f. or £4,000,000 sterling. Mr. Brassey estimated the cost at 120,000,000f.—£4,800,000 sterling. Sir John Hawkshaw and his associates did not consider it prudent to make the estimate from existing knowledge. The possibility of success is very much increased by the example of the Thames tunnel. There is also a tunnel under the Mersey, 1291 meters long, between Liverpool and Birkenhead, that is being cut through very hard material, six meters below the river. MM. Brunel and Douglas Fox, engineers, stated last February that with Beaumont's machine the perforation could be finished in two years.

The business and remunerativeness of the tunnel, fed by the great railway systems of Britain and the Continent, may be measured by the existing obstacles it overcomes. The delays and dangers of the sea prevent travel and diminish trade; but if impediments overcome in this manner, the movement would necessarily increase and new trade would be created. Every additional facility for transportation has had this consequence; and a junction of the British and Continental railways, connecting the shops and factories of different countries, by safe and speedy transit, would not only minister to the English desire for more traffic, but convey thousands to London and Manchester who would purchase more owing to the certainty of quick delivery at any part of the Continent. Then, too, London being within eight hours of Paris, the great population of that city, and of all Britain, would be led to seek the pleasant resorts of France and, above all, to visit Paris, that has a grand attraction for them. Hardly enough trains could be placed to transport the thousands who would exchange the triste British Sabbath for its joyous French fellow. In 1869 there was 353,279 passengers across the Strait at four ports—Havre, Dieppe, Boulogne and Calais. The time between London and Paris ranged from 10 to 20 hours; of which from one hour and a half to seven hours were at sea. The fare was from 20 to 75 francs. One-quarter of all the travel takes the shortest, although it is threefold the most expensive route. Any reduction in time between Dover and Calais would, by the authority of both countries, secure the whole business; and if this reduced time is accompanied by exemption from sea-sickness, and made agreeable, it is impossible to compute the possible increase, growing daily. London, too, is the world's greatest port for exchanges; and it is clear that those now made with the Continent would seek the shortest route. France now furnishes England with an enormous annual sum, not consisting solely of articles de Paris and other fabrications, but including cereals, wines and early fruits. The tunnel would increase this business vastly, and owing to the superiority of the French cuisine, would soon lead London to import all its grand dinners and banquets. The service of the Messagerie between the two capitals would be extended almost illimitably by digging two pits about 100 metres deep and a submarine gallery at right angles thereto.

It is to be borne in mind that railway transportation has advantages maritime never attains. The carriage of loose freights and of looms, and of carriages ready to receive machinery is very economical, because the packing that is so heavy a charge for machinery in particular is dispensed with. A very appreciable revenue would flow to the tunnel from this source. No other enterprise forms a comparison for the junction of the English and Continental railways. An idea may be obtained from the results of the Liverpool and Manchester Railway. When that line was opened in 1830 the transportation of travelers was by stages, and of merchandise by carts and boats. The annual travel of 21,000 persons was quadrupled at once, though the speed was but twenty-seven kilometres an hour. The passengers increased seven fold in 1837, when the speed had advanced to forty-three kilometres. Now three lines of railway carry more than 750,000 travelers between the two cities annually. The merchandise increased from 1432 tons the first month to 5104 the fourth, and has continued to increase, though in a lower ratio than passengers. The statement, of which this is an epitome, is accompanied by a chart of Calais; by one showing the entrance on the English coast at St. Marguerite, near Dover, and a little remote from Calais on the French shore; and by a profile exhibiting the relation of the tunnel to the water and its entrances. The prosecution of the plan is not yet certain. The preliminary company in France is formed with £80,000 capital to sink the two French shafts, and that accomplished, to obtain £100,000 more for driving the horizontal galleries as described; this succeeding, the company proper are to prosecute the real work. The Channel Company have revived a slumbering Intercontinental Railway Company in Spain, that has existed in a dormant state some years. Its purpose is to tunnel the Straits of Gibralter at a depth of 3000 feet for a railway to Africa.

An exchange says: It sometimes happens that the interior diameter of a tire becomes so large that it will not fit the wheel. This may be corrected according to a plan that has been introduced by German mechanics, by heating the tire red hot, and holding it in that condition half immersed in cold water until cold, then heating again red hot, and immersing the other half in the same way. In the first operation the un-immersed hot portion must contract with the portion rapidly cooled, with a corresponding condensation of material, and consequent permanent diminution of diameter, and in the second operation a similar effect is produced on the other half. The heating and chilling may be repeated until this purpose is answered. This resort is not confined to tires alone—as an instance is recorded where a ring of Bessemer steel, which was used as a flange ring, had been entirely misshaped by an inexperienced workman, and was drawn into shape by heating fifteen times and cooling different portions at a time.

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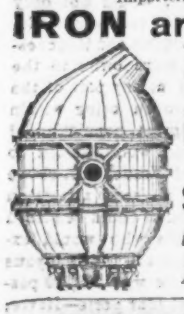

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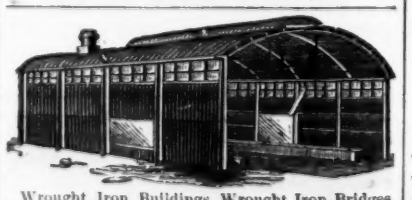

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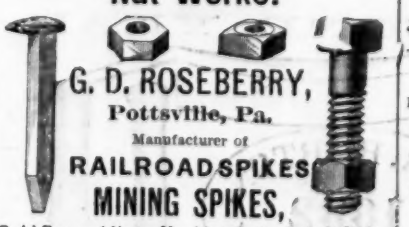

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New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents lately issued, which will be found interesting:

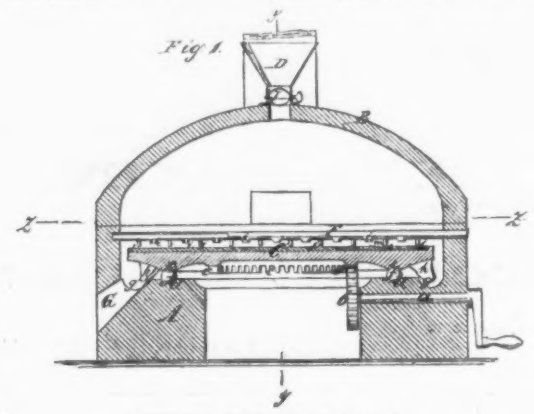
IMPROVEMENT IN DESULPHURIZING OVENS.

Specification forming part of Letters Patent No. 99,143, dated January 25, 1870, issued to John C. Brewster, of New York:

This invention is illustrated in the accompanying drawing, in which Figure 1 represents a vertical section in the plane *x x*, Fig. 2. Fig. 2 is a similar section in the plane *y y*, Fig. 1.

Similar letters indicate corresponding parts.

It relates to furnaces or ovens for desulphurizing ores or minerals which have been previously stamped or crushed, and consists in constructing the base of an oven for desulphurizing ores with a groove for receiving and holding friction balls or rollers, and a seat for receiving a horizontal shaft, which carries a pinion at the end for operating the revolving table, which rests upon the friction balls or rollers arranged in the groove in the base of the oven.

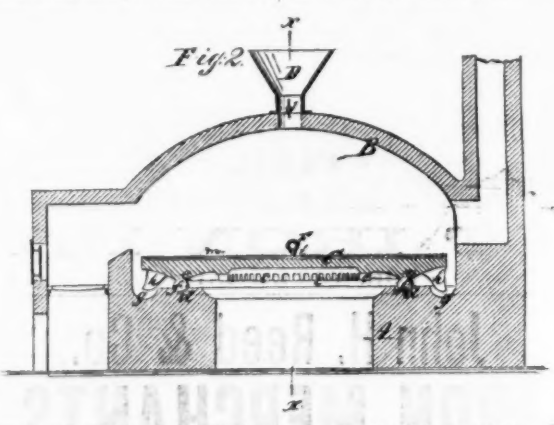


IMPROVED DESULPHURIZING OVEN.

The revolving table is constructed with a groove, into which the friction balls and rollers fit, and with a gear wheel, with which the pinion on the horizontal shaft meshes. Across the revolving table passes an air pipe or tube, having jet openings and agitating fingers, and situated close to the table, in such a manner that as the table revolves the air is thrown down through the apertures in the tube, under and among the ores spread on the table, while the latter is kept in motion, and the ore is constantly stirred by the fingers.

The invention further consists in the combination, with a furnace having a revolving table, of a channel for receiving the ore from the table, and a series of wipers, constructed to automatically remove the ore from the furnace through a discharge opening, as will be hereinafter described.

In the drawing, the letter A designates the base of the oven, which is constructed, preferably, of a circular form, and provided with the



necessary fire place and chimney. B is the top or crown of the oven, constructed of an arched shape to deflect the flames and heat upon the ore, and provided with a hopper, D, for introducing the ore. The revolving table C rests upon the anti-friction rollers *f f*, which play in the grooves *d e*, the former situated in the base of the oven, and the latter in the under surface of the table. Said table receives its motion through a shaft, *a*, carrying a pinion, *b*, which engages with cogs *c* on the under surface of the table. The surface of the table is composed of a stratum of fire clay, *m*, which is laid within a flange or rim on the circumference. F is a tube, through which air is admitted to the ore spread on the table C. This tube is situated immediately above the surface of the table, and is provided with a series of apertures, *i*, and a series of fingers, *j*, so that as the table revolves beneath it the air is thrown down through the apertures of the tube, among the ore spread upon the table, while the latter is kept in motion and constantly stirred by the action of the fingers. The supply of ore from the hopper D, regulated by a gate, J, in it, falls upon the center of the revolving table, where it is spread by the action of the fingers *j*, and gradually worked off the edge of the table, whence it falls into the channel or trough *g*. A series of sweeps, *h h*, attached to the under side of the table, then act upon it to discharge it through the orifice G.

Claim.—1. The base of the oven, constructed with a groove for receiving friction balls, and a seat for the shaft *a*, carrying the pinion *b*, in combination with the rotary table, having the groove *c*, gearing *c*, and a stationary air pipe having jet openings.

2. The combination, with the revolving table in a furnace, of a receiving channel or trough, and of wipers, for the purpose of automatically removing the ore from the furnace.

Among recent industrial developments in Germany is the hollow iron furniture, which has been popular for years in Austria. In Germany, however, it is only quite lately that the first large factory for making this class of goods has been opened. Ribbon iron of the best quality is taken and converted into tubing in pieces about 16 feet long, which can be bent cold into any form suitable for the making of bedsteads, doors, tables, &c. Hollow iron is stronger and lighter than the solid iron usually employed heretofore, and possesses the special advantage that the rivets hold better and that it does not break so easily, as is frequently the case in solid iron, which gives way wherever there is a flaw.

Railway Accidents.

Chas. Francis Adams, Jr., in a lecture on this subject, presented the following comparative statistics, from which it is logical to conclude, with Mark Twain, that it is safer to travel by rail than to stay at home, and that accident policies should be taken out for the days we do not travel:

It might seem brutal to say so, but in few ways were lives lost with so much great immediate benefit to the world as in railroad accidents. The whole world traveled thenceforth more safely for every life lost. New appliances, new precautions and severer discipline followed every accident. During the first 11 years of railroad experience almost no disastrous accidents occured. The first terrible one was one on the Versailles road in France, in May, 1842, when an engine broke down while running at high speed, and its cars piled up on top of it. The doors of the cars were locked, they took fire, and 53 persons were crushed or burned to death and many injured. The lecturer showed how recent improvements in construction had obviated the danger of such accidents. In New England there have been three terrible accidents; that at the Norwalk drawbridge, in May, 1853; that at Valley Falls, R. I., on August 12, 1853, and that at Revere Station, in August, 1871. Each of these was analysed, and illustrated by the experience of many others of like character elsewhere. All of them were preventible, and there could be no excuse for their recurrence. The various appliances which had been adopted in consequence of these accidents were referred to, and the opinion was expressed that the Revere disaster had reduced the dangers incident to railroad traveling in Massachusetts by one-half. It had brought the train brake and the "Miller" platform into general use; it had caused the increased adoption of running signals and greatly improved discipline. The lecturer then passed to accidents which had not happened. Since the Revere accident 120,000,000 of passengers had been carried within the limits of Massachusetts. How many of these had been killed by faults of the companies and by accidents over which the passenger himself had no control? Just one. This statement applied only to passengers exercising due care; in all ways connected with the operation of railroads about 300 people a year were killed or injured in the State. Another question: What is the length in Massachusetts of the average railroad journey resulting in death? The answer sounds absurd; it is 324,000,000 of miles. That is, on an average, 22,000,000 persons travel 15 miles each before any one of them is killed by a railroad accident. So the average journey resulting in injury is 24,000,000 miles. If a person traveled as a passenger on Massachusetts roads eight hundred miles a day, every day of his life, he would, by a doctrine of chances, be 70 years old before he would receive an injury in a railroad accident. French statistics showed that stage coach traveling was at least fifty times as dangerous as traveling by rail. The danger of being murdered in Massachusetts was greater by far than that of being killed in a railroad accident. In 1873 the roads carried 22,000,000 passangers without killing one; in the same year in Boston alone five persons were killed by tumbling down stairs, seven by falling out of windows. With 70,000 miles of track, full of curves, culverts and bridges, with safety depending on everything, from the state of the atmosphere to the strength of the rail—with trains moving in every direction, at all times—accidents must happen, since the managers are human. That they should happen so rarely is the true cause for wonder. There is no more wonderful human achievement than the combinations of speed and safety with which the movement of modern civilization is maintained through the unceasing exercise of human care, human skill and human foresight.

Straight Edges.

The *English Mechanic* offers the following suggestion concerning the method of making straight edges:

Perfect accuracy of outlines is of the highest importance in the construction of all machines and parts of machines. The amount of care requisite to the production of a good straight edge, or surface plate, is very great. The means by which this accuracy is attained are somewhat as follows:

Three pieces of mahogany, or other hard wood, about 3 feet long by quarter inch thick, are planed up as truly as possible, the planed surfaces of all three being from time to time applied to one another, in order to judge of the trueness to which the surfaces are being reduced. When any one of three prepared surfaces will lie on the prepared surface of either of the other two without allowing any light to pass through the line of junction, the edges may be considered sufficiently true to admit of their being used in the production of a metallic straight edge. To this end three similar strips of steel, of the size desired, are smoothed or cleaned upon their sides on a grindstone or with a file. They are then laid one upon the other, and a hole drilled at each end, a rather tight-fitting pin or rivet being run through each hole to keep the three bars together. In this state they will appear as one thickish bar. The compound bar being placed in the vice and clamped on each side with sheet lead or zinc, the edges are filed level, beginning first with a rough file, and gradually increasing in fineness. Every now and then the edge being produced is tested against one of the wooden edges above described, which should be previously rubbed over with red chalk, etc., to render prominences visible. When the eye no longer detects any differences in level on the application of the wooden straight edge, the steel pieces are to be removed from the vice and pins extracted. They must now be tested against one another, until, by careful filing and repeated comparison with one another, it is found that the edges of all three will unite closely without any irregularity being perceptible. A good way of ascertaining whether any such exists, is to place two edges in contact and rub them together with some force; the prominent portions will by this treatment be somewhat burnished, and will render themselves apparent by their superior luster. The reason why three edges should be prepared simultaneous will be sufficiently evident on reflection. It will be readily understood that if A and B were two strips of steel, that A might be slightly concave and B correspondingly convex, without the eye being able to detect any fault, as no light would pass; but if a third strip C, having the same convexity as B, were applied against the latter, the fault would immediately become apparent, and on correcting the faults of B and C, and applying them to B, the concavity of this latter would also be rendered visible. We owe the above method of producing a true plane surface to Sir J. Whitworth, who in 1840 pointed out the unsatisfactory nature of the edges and surfaces which up to that time had been produced in metals by grinding alone.

Pneumatic Dispatch.

On Sunday, February 28, the pneumatic mail system was opened for public use in the city of Vienna, and for the few days of its working it appears to have been eminently satisfactory. By this method, letters and packages not exceeding two ounces in weight can be sent from one end of the city to another—a distance of about eight miles—in something less than two seconds, so that, adding to this the time necessary for making up packages, assorting them and delivering them, the whole is just about one hour. But this only covers extreme distances, and the managers of this system in Vienna say that in a short time the time between the receipt and delivery will be greatly reduced. In fact, between stations only two or three miles distant from each other such packages are even now delivered within 20 minutes after being deposited. Any postmaster in this city, or postmaster general, who could inaugurate such a reform in the local mail arrangements of the metropolis, might achieve immortal fame. As the general post office in Vienna is also in the building of the general telegraph office, powerful steam engines are constantly at work compressing atmospheric air in a mammoth reservoir, from which the double system of cast iron pipes, laid three feet under the surface of the streets, are fed. One system of pipes serves for carrying packages, and the other for pushing them ahead in the other direction. At the seven principal stations, in various parts of the city, similar engines are kept at work day and night drawing the air from the pipes, and creating a vacuum in front of the packages, which are thus more rapidly pressed forward by the expansive force of the compressed air behind them. The 60 sub-stations are connected not only with the two central offices, but also with each other by this double system of pipes. The dispatch of each package is announced by telegraph to the office to which it is sent, and to all intervening offices to advise the latter not to stop it on its way. The pipes are six inches in diameter, with a perfectly smooth polished inner surface, and the packages are made up in India rubber cylinders of various lengths. The postage on mail matter must be prepaid at the rate of two kreutzers (one cent) for each half ounce or fraction, which is evidently much cheaper than the two cent postage for the city letters in this country. This is the first instance of a large city—Vienna has about 900,000 inhabitants—giving its people such facilities of correspondence at moderate cost.

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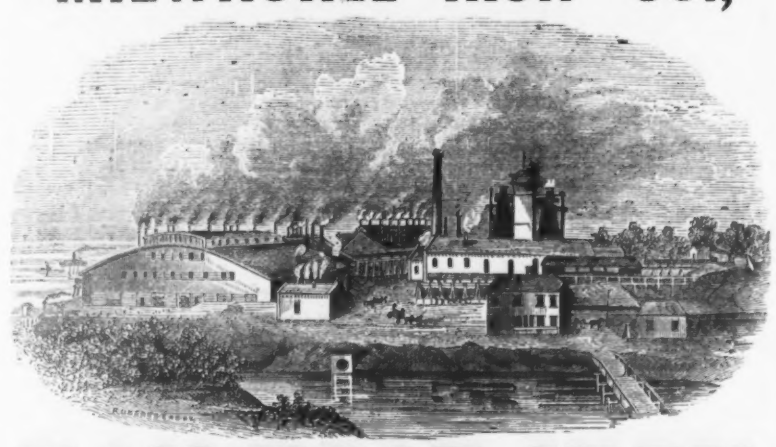

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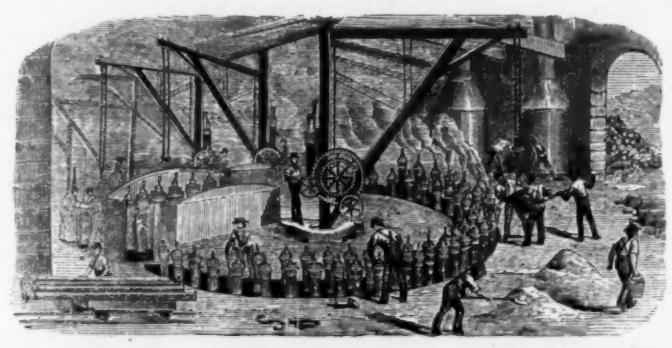

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Some Recent Developments in the Technology of Iron.

We take the following from *Iron:*

Among the traditional sayings handed down from generation to generation, as embodying the accumulated experience of centuries, none recur more frequently than those which enunciate with singular unanimity the unpalatable truth that adversity teaches lessons more valuable and indispensable than any we care to learn in times of brighter fortune. "The pupils of misfortune are the aptest scholars:" "Adversity is the road to prosperity"—such is the burden echoed through the proverbs of all nations and all times. There are, moreover, few of us who do not have frequent—often as we think, too frequent—opportunities of putting the assertion to the test, and it is well for us if we prove its truth. Those engaged in the manufacture of iron—one of the most precarious as it is certainly the greatest of human industries—have now such an opportunity. They are passing through one of those periodically recurrent phases, if not of actual adversity, yet of considerable depression and stagnation, of which the duration may be indefinitely prolonged.

It seems, therefore, a fitting time to turn to account the enforced leisure which accompanies such negative crises, by reviewing the more recent developments of the science and practice of the iron metallurgy, with a view to their application on the return of more prosperous days, whose advent nothing would so much tend to accelerate, as an enlightened attention to those economic details by which alone the cost of production can be lowered, so as to enlarge again the now untowardly slender margin of profit. The more so, as there is no reason so propitious to the improvement of plant, the trial of novelties, and the modification of processes, as a time of slackness. Under the high pressure of the past few years invention after invention has been developed, many being of approved practical value, and all aiming at the introduction of fundamental changes in the existing course of manufacture. A number of these inventions are of American origin, and we must look to ourselves lest we find the Americans with their extraordinary natural advantages, aided by a practical ingenuity probably superior, and certainly not inferior to our own, not only driving us out of their own markets, but proving formidable rivals on neutral ground. Hitherto the United States, despite their enormous deposits of ore and fuel, have labored under the disadvantage of the fuel being, in the majority of cases, in situations far removed from the ore ground. This is notably the case with the pure and abundant ores of the Lake Superior district. The rapid progress of railway building, and the discovery of fresh coal fields, together with the successful application of inferior fuels, tends, however, to reduce this drawback to a minimum. It is probable, also, that, when the excessive depression which now prevails in the States passes away, labor will be materially cheaper, and scientific methods will supersede much of that wasteful and careless practice which protection and an ever increasing demand permitted, not only to exist, but to prosper. Simultaneously with a remarkable advance in the practical details of metallurgical appliances and processes, there has been a not less conspicuous extension of the boundaries of our theoretical knowledge. Since the publication, in 1864, of Dr. Percy's admirable treaties, which (with the exception of Truran's work, which deals with the subject almost exclusively from the engineer's point of view) was the first contribution of real importance to the technical literature of iron by the greatest iron producing nation in the world, there has been hardly any effort to deal comprehensively with the additional facts and observations which have accumulated year by year, through the labors of a constantly increasing band of scientifically-trained investigators. It is to be hoped that a new edition of Dr. Percy's work, embodying recent results and progress, may be soon forthcoming, so that we may have the advantage of his judgment on matters on which he is so well qualified to give an opinion. In the meantime, the meetings of the Iron and Steel Institute, as well as those of the various engineering and scientific societies, have served as an arena for the discussion of some of the more important questions thus raised, though the possibly unavoidable intrusion of personal feeling may at times have somewhat obscured the views and prejudiced the impartiality of the controversialists, and rendered the more desirable an independent retrospect of the conclusions actually arrived at. So important, however, are the interests involved in the proper appreciation of these investigations and discussions, that it may be well to examine *seriatim* the various chemical and technical considerations on which they depend.

The first and most important process in the manufacture of any metal is unquestionably its reduction from its ore. The only ores actually worked for the production of iron are the sesquioxide (better known as hematite or brown hematite, the latter being a hydrated variety); the magnetic oxide, Fe_3O_4; and the carbonates or spathic ores; among the latter are included the clay ironstones so extensively worked in Wales, Staffordshire and Cleveland, and the Scottish blackband. On calcination, the carbonates part readily with their carbonic acid, and are simultaneously oxidized, mainly to the sesquioxide (Fe_2O_3). Thus the question of reduction is practically narrowed to the consideration of the most speedy and economical means of depriving of their oxygen these two oxides, Fe_3O_4 and Fe_2O_3; and, indeed, the magnetic oxide is so rarely smelted in this country that we need hardly concern ourselves with any other than the sesquioxide, under the various physical conditions in which we find it. Unfortunately, however, the reduction is complicated, especially in the case of the carbonates, which constitute the bulk of English ores, by the necessity of getting rid of the gangue or earthy matter intermixed with the ore. This earthy matter, consisting mainly of silicate of alumina and free silica, is infusible, unless its fusion be assisted by the presence of some body with which it may unite to form a fusible silicate. Lime serves this purpose admirably, and its presence not only assists in the formation of a sufficiently fusible slag, but also serves to prevent the loss of iron in the slag, which its protoxide would otherwise form with the silica. Should the gangue itself be calcareous, silica becomes the appropriate flux. Obvious as are the theoretical advantages (hereafter to be more fully treated of) which attach to the *direct* production of steel and malleable iron from the ore, the *indirect* process, in which pig is produced, not only for foundry purposes, but also as a preliminary to the production of forge metal and steel, has, in England, owing in some measure to local circumstances, obtained a development so gigantic, to the total exclusion of the older bloomery furnace, that it clearly has the first claim on our consideration. It is, moreover, in the chemistry of the blast furnace that the greatest strides have been recently made, establishing, indeed, such an advance on our previous knowledge as to remove the operations taking place in that elaborately simple, yet gigantic, structure altogether from the domain of mere technical empiricism. Among the more recent laborers in this field have been Gruner, Tunner, Schintz and, above all, our countryman, Mr. I. Lowthian Bell. It is chiefly to him that we are indebted for those precise determinations and logically drawn conclusions which have at last given a sound experimental basis to our theorizing on the complicated changes which occur in the interior of the blast furnace, while he has afforded the commendable example of a hereditary and successful iron master, not only organizing a well-conceived course of experimental investigations, but having the candor and sagacity to throw open the fruits of the experience thus gained for the free use of his manufacturing rivals.

The changes of which the blast furnace is the seat, regarded in their simplest form, are the oxidation of the fuel by the oxygen of the blast; reduction of the oxide of iron; carburization of the reduced iron; and, finally, fusion of the carburized metal with formation and separation of the slag. If, however, raw carbonates are used, their calcination, or the removal of their carbonic acid, takes place in the upper part of the furnace; while in all but freshly calcined ores there is present a certain amount of moisture which is also expelled near the top of the furnace. Then again, there is the calcination of the limestone, in which form the requisite amount of lime is generally charged into the furnace. The reduction of silica, sulphates and phosphates is yet another minor operation, with which the iron master would be glad to dispense. One frequently finds the ingenuity of metallurgical writers displayed in the accurate division of the interior of the blast furnace into horizontal zones, marked with regular boundaries, to the several spaces within which it suggested that each of these actions is confined. Thus we have the zone of preparation, of reduction, of carburization, and of fusion. The futility of this arbitrarily precise topography was pointed out by Dr. Percy, but its inaccuracy has been still further disclosed by subsequent observations, which tend to show that any division other than a distinction between the melting zone and non-melting zone would, except as a matter of convention and convenience, be groundless.

In each of the operations indicated—which, however, are far from exhausting the list of actual reactions—heat is absorbed or produced, and the theoretical simplicity of the reducing action is modified to an embarrassing extent. The agencies by which these effects of reduction, and heat production, and carburation are effected are mainly carbonic oxide and solid carbon, the former playing the larger part. The cyanides and cyanogen, hydrogen and ammonia, nevertheless, have a certain auxiliary influence on the results, while it will be seen that a comprehension of the modifying or negative action of carbonic acid is absolutely necessary at the outset. It will be the most convenient course to assume for the present the presence of these bodies, and examine their individual action upon oxide of iron before considering their relative importance in the actual operations. Dr. Percy disposes of the subject in the following paragraphs, which perhaps sufficiently summarize all that was then accurately ascertained on the subject: "Sesquioxide of iron," says the doctor, "is easily reduced to the metallic state when heated to redness in contact with carbon, carbonic oxide, hydrogen, ammonia or cyanogen. When reduction by any of these agents takes place at a comparatively low temperature, the metal is left in a pulverulent state; when the temperature is high, a coherent mass of malleable iron is produced, which may be readily forged with solid metal. * * * In reduction by hydrogen, magnetic oxide is first formed." This, with the exception of some observations on reduction by solid carbon, was about the limit of our acquantance with the action of reducing agents on iron ores, unless we except Ebelmen's experiments on the changes which materials undergo in their descent through the blast furnace, in which there were neither analyses taken of the gases, nor were the conditions such as to allow of reliable conclusions being arrived at.

It has been stated that carbonic oxide is the most operative of the various reducing bodies present, and it was to ascertain the conditions and modes of its action that Mr. Bell's experiments were chiefly directed. He found that on passing pure carbonic oxide over calcined Cleveland ironstone it began to be deoxidized at about 210° C., but at this temperature only 28 per cent. of the oxygen present was removed in an hour. At about 415° C., the proportion of oxygen removed in an hour was nearly 6 per cent. This latter temperature is that fixed by Gay Lussac and other experimenters for the first signs of reduction taking place. Now, this temperature is but little over that of the escaping gases of an average blast furnace, so that, as far as their carbonic oxide is concerned, it might begin its reducting action from the moment of charging. By a six hours' exposure to carbonic oxide at something under this temperature, from 37 to 50 per cent. of the oxygen was removed. An exposure of 3¾ hours at a bright red heat cost the ore 90 per cent. of its original oxygen. By a longer exposure to a bright red heat, with carbonic oxide, the remaining 10 per cent. of oxygen was reduced in amount, but there always remains a certain small proportion of oxygen, which Bell suggests to exist as a suboxide, Fe_2O. This leads to the consideration of the mode in which the reduction by carbonic oxide is effected. It was discovered by Caron that carbon was deposited on oxide of iron when exposed to carbonic oxide at a temperature under redness, a fact independently observed by Schintz; Bell, however, carrying further these experiments deduces from them very important conclusions. He found that at a temperature but little over 200° C. carbonic oxide deposits on the oxide over which it passes minutely divided carbon. It is, however, at temperatures bordering on 450° C. that this phenomenon is most pronounced. The oxide at this temperature, soon after the commencement of the reduction, cracks, swells up, and is not only covered externally with a deposit of powdery carbon, but its interior is simultaneously penetrated with the fine deposit. M. Gruner and other French *savants*, who have repeated and studied these experiments, consider that the formation of metallic iron is necessary to initiate the deposit of carbon, but Mr. Bell believes that it is the presence of some suboxide which induces the splitting up the carbonic oxide. The weight of carbon thus deposited is very variable. In some cases the carbon deposited on hematite will equal five times the weight of the iron present. At other times, under apparently identical conditions, the carbon will be less in weight than the iron. In all cases the deposit on calcined Cleveland is immensely less than that on hematite or precipitated oxide. On the function of the deposited carbon there is also some divergence of opinion, but there can be little doubt that the carbon thus penetrating the oxide effects the removal of oxygen after the gas has exhausted its deoxidizing power. It would appear, however, notwithstanding Dr. Percy's dictum, that the last traces of oxygen cannot be removed even by the joint agency of the carbon and carbonic oxide at a full red heat, the deoxidation being only terminated when fusion has taken place. Carbon deposition, as would be anticipated, diminishes rapidly at temperatures approaching redness, and ceases entirely at a red heat. These researches throw considerable light on the discussion between Le Play and Gay Lussac as to the relative importance of carbonic oxide and solid carbon as reducing agents.

It is not surprising that the molecular and mechanical condition of the oxide should materially affect the readiness with which deoxidation overtakes it, and experience abundantly demonstrates that this is the case. Thus Fe^2O^3, precipitated from a solution by ammonia, is far more susceptible to deoxidation than any natural oxide, and carbonic oxide commences to reduce it at 130° C. Of more practical value are observations on the relative behavior of the natural ores, but in this direction there is a deficiency of experimental information, the greater part of Mr. Bell's experiments having been carried out on Cleveland stone. As instances of this differing reducibility we have—

	Original Oxygen.
Calcined Cleveland, 40 per cent. iron, exposed for 7½ hours to CO, losing at 410° C.	20 per cent.
Calcined Spathose ore, 52 per cent. iron, exposed for 7½ hours to CO, losing at 410° C.	28 "
Lancashire hematite, 40 per cent. iron, exposed for 7½ hours to CO, losing at 410° C.	57 "
Calcined Cleveland, 40 per cent. iron, exposed for 7 hours to CO, losing at 417° C.	9·4 "
Calcined Cleveland, 40 per cent. iron, exposed for 6 hours to CO, losing at 410° C.	37 "
Lancashire hematite, 67 per cent. iron, exposed for 6 hours to CO, losing at 410° C.	36 "
Elba specular ore, 68 per cent. iron, exposed for 6 hours to CO, losing at 410° C.	17 "
Calcined Spathose ore, 52 per cent. iron, exposed for 6 hours to CO, losing at 410° C.	15 "

These results appear at first sight hopelessly anomalous, nor, indeed, have the apparent contradictions been satisfactorily explained. In one case we have a poor hematite deoxidized to thrice, and even five times the extent of Cleveland stone subjected to the same influences; in another we find a rich hematite actually less susceptible than Cleveland ore. Doubtless the difference in the results is in part due to a difference in the speed of the current of gas to which the ores were exposed; but the question being a vital one in blast furnace economy needs further elucidation. Experimenting on further samples of the last four ores in the table above, with a gas current four times more rapid than that used in the previous experiments, Bell found the results considerably modified. Thus while the hematite lost 71 per cent. of its oxygen, the Cleveland lost only 50 per cent., the spathose 42 per cent., and the specular ore 18 per cent.

Metallic iron has also the property of dissociating carbonic oxide at temperatures between 300° and a bright red heat, with deposition of carbon and the formation of an infinitessimal amount of oxide.

(To be continued.)

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" per doz	6 00
Rings per box (100) coppered wire	50
" per doz boxes (1200) "	3 00
" per box (100) tinned wire	60
" per doz. boxes (1200) tinned wire	4 00
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" " per doz	9 00

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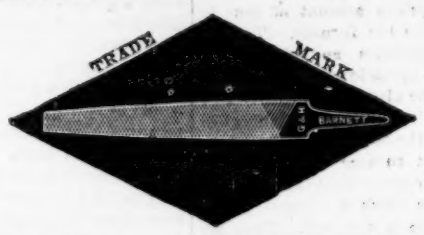

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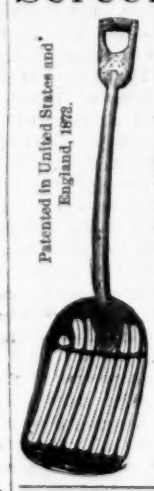

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BUSINESS ITEMS.

PENNSYLVANIA.

The contract for the superstructure of the proposed railroad bridge across the Delaware River, near Yardleyville, on the line of the new road between Philadelphia and New York, now in course of construction by the North Pennsylvania and the Delaware and Bound Brook Railroad Companies, has been awarded to Messrs. J. H. Cofrode & Co., of Philadelphia, for $253,000. The bridge is to be of wrought iron, and is to be for double track, and will consist of 15 spans, varying in length from 60 to 200 feet.

The Catasauqua *Dispatch* of the 27th ult. says: "The Crane and Thomas Iron Co.'s have commenced to use Connellsville coke, the latter having used it at Alburtis for some time, while the former company have about 2000 tons on the way at present, some of it having arrived. The continuance of the coal strike prevents the companies from getting the usual supply of anthracite, and in order to keep the furnaces in blast, coke is conveyed from Connellsville, near Pittsburgh, to this neighborhood, involving great expense. It is conveyed in box cars, each car containing about 12 tons.

The Altoona *Tribune* of March 25th says: Orders have been received at the shops of the Pennsylvania Railroad Company, in this city, for several new cars to be denominated "Centennial passenger cars," and it is also stated that a number of new locomotives are to be built. During the past several days a number of additional workmen have been employed in the company's shop at this point. The future looks bright, so far as Altoona is concerned.

The Allentown *Chronicle* says: The experiment at the Thomas Iron Company's furnaces at Alburtis, with coke for fuel, has proved successful. At first, with a seven pound blast, the managers were inclined to become discouraged, but after getting the blast down to three pounds and a quarter it worked admirably, so much so that the Crone Iron Company have purchased a large quantity of this kind of fuel and are saved from any danger of having to blow out.

The Philadelphia and Reading Railroad Company's rolling mill, at Reading, resumed work March 29, after a stoppage of three months.

CONNECTICUT.

The Hartford Foundry and Machine Company, successors to the Woodruff and Beach Iron Works, are now at work on a contract for seven of the celebrated engines formerly made by that company, also two double engines with link motion, to be used for a special purpose. These engines are to have the patent cut-off, and will be in every respect equal to the standard machines of the old company. They are also at work on two large composition buckets for the Board of Water Commissioners, of St. Louis, the aggregate weight of which will be about 9000 pounds; these are for the pumps now in use, and not for the new ones lately erected by the Hartford Foundry and Machine Company for the same city. The last mentioned pumps were started up a few weeks ago and made a run of 82 hours without having a hot journal or bearing during the whole time.

MASSACHUSETTS.

The Mason Machine Works, at Taunton, have just completed a double truck narrow gauge engine, with 15 by 20 inch cylinders, for the North Pacific Coast Road.

The Excelsior Gas Machine Company, of Warren, have decided to remove their works to South Norwalk, Conn., where they have bought a fine large wharf adjoining the steamboat landing, and only 1000 feet from the New York, New Haven and Hartford Railroad depot. Their Norwalk factory is to be 40x80 feet, two stories high, and supplied with a 30 horse-power boiler. In addition to their gas machines for furnishing from 100 to 10,000 burners, they will also manufacture a carbonating machine that requires winding up but once a month, this machine being especially adapted for lighting buildings, requiring less than 150 burners, gas fixtures, street lanterns, etc. A large proportion of the operatives in the present works will remove to Norwalk, and the new works will be soon in running order.

It is stated that the Taunton Car Works have been sold to Oliver Ames, S. L. Crocker and Wm. Mason for $16,000.

The new foundry building of the Kinsley Iron and Machine Company, at Canton, is partly raised, and the work is progressing as rapidly as the weather will permit. The large hammers are now running in the newly raised building.

OHIO.

The Cleveland Iron Company's rolling mill is still idle by reason of the puddlers awaiting the action of the Pittsburgh strikers. The furnace is working all right making 40 tons of pig metal per day.

An effort is being made to organize a company in Cleveland, to build works and engage in the manufacture of cast steel castings, of any pattern.

The project of building a rolling mill at some point near Fairport, Lake county, is being pushed forward by those interested, and at present it seems to be certain that the enterprise will be successfully established during the coming season.

The Standard Nut Company, Cleveland, kept their works running throughout the panic, and are still going ahead. They manufacture only the hot pressed nuts, and are shipping them to all parts of the United States and Canada.

Plows are being sent to Germany by Butcher & Gibbs, agricultural implement manufacturers, Canton.

The melting capacity of Culbertson, Wiley & Co.'s foundry, at Martin's Ferry, is from 15 to 25 tons daily. It was built between 1845 and 1850, the machine shop having been built at a later period. Fifteen hands are employed, and the productions are steam engines and rolling mill, blast furnace and agricultural implement castings, etc.

Shipments of 28 car loads of Champion reapers and mowers to the Pacific coast have lately been made by Warder, Mitchell & Co., of Springfield. The freight on these shipments amounted to the sum of $11,500, being $412·50 per car. This firm has also recently shipped 52 car loads of Champions to Europe, and will continue to send forward on orders already received at the rate of two car loads per day for the next thirty days. Whitely, Fassler & Kelley are boxing a large lot of machines for the South American market, which they have opened this year for the first time.

The Cleveland Rolling Mill Co. have put in a new punching, slotting and straightening machine, designed and built by Marchand & Morgan, which effects a great saving in labor. The operations of punching, slotting and straightening the rails are performed in regular succession, thus avoiding the necessity of re-handling, or the addition of any other machine.

ILLINOIS.

The new enterprise at Chicago, known as the Sheffield Steel Works, possesses facilities for turning out 1½ tons of tool steel per day. The company is at present employing 15 hands, and producing one ton of steel per day.

Messrs. N. & A. Middleton, of Philadelphia and Chicago, have taken an order for 3000 sets of springs for coal cars from the Central Railroad of New Jersey.

The rail mill of the Springfield Iron Co. turned out in one week recently 802 tons of silicon steel rails, working 11 single turns, with one train of rolls, the rails averaging 58 lbs. to the yard, and the finishing rolls were changed once during the time.

CALIFORNIA.

We take the following from the San Francisco *Scientific Press:* Mr. W. W. Hanscom, late of the Ætna Works, is engaged in erecting a foundry and machine shop on the corner of Minnesota and Santa Clara streets (Portrero). The building when completed will be 260 feet long by 40 feet broad, to be divided as follows: Machine shop, 160 by 40; foundry, 100 by 40. It is to be known as the "Hope" Iron Works. A boiler is in course of construction for this establishment at the San Francisco boiler works Mr. Hanscom's reputation as an engineer and practical founder ensures the excellence of any work he undertakes. He intends making a specialty of vertical, stationary and propeller engines, for yachts and small steamers. Mr. Hanscom hopes to have his works in operation within thirty days.

The Strength of Wood and the Efficiency of the Axe.—In a recent volume of the annals of the Forest Academy, at Mariabrun, near Vienna, Prof. W. F. Exner gives a novel and highly instructive analysis of the elasticity and strength of wood, its resistance to splitting, and the use of the wedge, the axe, &c. The importance of these matters he shows to be very great, because great industries depend upon the facility with which wood can be split, and upon the applicability of certain kinds of wood. Having deduced a few simple formulæ to express the strength of woods and the power of the wedge, he develops a formula for the force with which an axe is handled, and shows what curve should be given to the face or cheek of the axe, in order to secure, under certain conditions, the least waste of power. By these formulæ he is able to demonstrate that the splitting efficiencies of the best axes made in Vienna, Prague and America, are to each other as 13·3, 9·2, and 4·9, respectively; and applying his formulæ to the elaborate experiments of Nordlingen, he is able to deduce the absolute ease with which various woods can be split.

Philip A. Small, who died at York, Penn., on Saturday, at the age of 79, was a prominent member of the mercantile community in that State. He became in 1831 head of the firm which his father had founded, and in partnership with his brother Samuel embarked extensively in general trade, doing a large amount of business in Maryland and Pennsylvania. He was instrumental, also, in establishing iron furnaces at Ashland and elsewhere in Maryland. Mr. Small was a worthy gentleman, possessing great energy, and endowed with remarkable aptitude for commercial affairs.

Early in the morning of Sunday last the finishing department of Cooper, Hewitt & Co's wire mill, in Trenton, N. J., was destroyed by fire, causing damage to the amount of about $60,000. There was no insurance on the property. The fire is supposed to be the work of an incendiary, and is the first in this building in 28 years. A large 120 horse-power steam engine, and 84,000 pounds of wire, ready for the market, were among the property destroyed. The mill will be rebuilt within 90 days. The 350 workmen employed will not be idle, as they will be engaged in the reconstruction of the building, or will be employed elsewhere until the work of rebuilding is completed.

About eight years ago it was discovered that there were on the north coast of Labrador large quantities of magnetic iron ore in sand, but for a long time no one could be induced to take in hand the working of this mineral wealth. It now appears likely, however, that this enterprise will be undertaken and will be prosecuted with vigor. The problem of how to reduce this economically appears now to be in a fair way of being solved. Two Quebec gentlemen began in June last to put up the necessary houses, at a place called Black Point, between St. John's River and Mingan, having previously made arrangements with certain Swansea manufacturers to buy the black sand when prepared. Twenty-three men have been constantly employed since that time in preparing the sand, which contains in the rough state 30 per cent. and when concentrated 99 per cent. of magnetic iron ore. Quebec has established a factory for the fabrication of steel from this sand, and Messrs. Duval & Michaud have already sent up several tons of the ore to that city. At Matasquan, also, an establishment is being built.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS, TOOLS FOR BRAZING, &c.

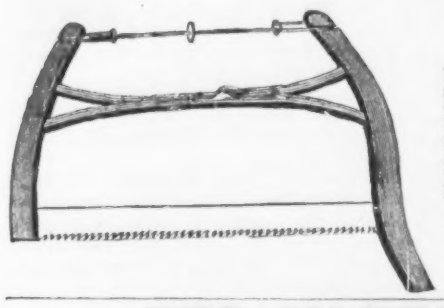
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

Sole Proprietor & Manufacturer,

VULCAN SAW WORKS.

WILLIAMSBURGH, N. Y.

THE SILVER STEEL DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

PATENT HANDLES AND GAUGE INCLUDED.

Patent Secured

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by E. C. ATKINS & CO., Indianapolis, Ind., who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

E. C. ATKINS. H. KNIPPENBERG. **E. C. ATKINS & CO.**

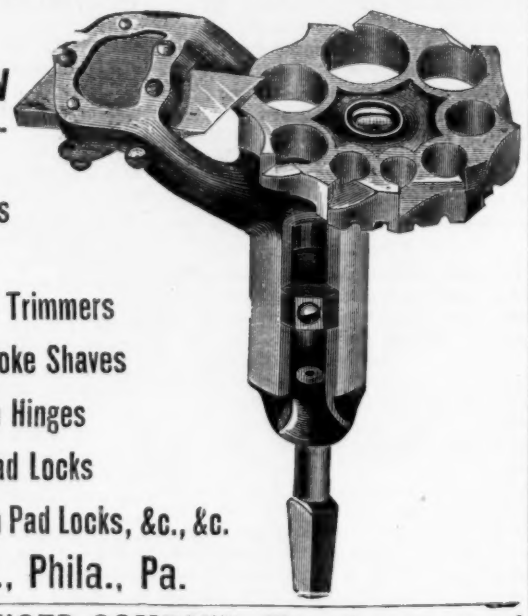
Saw Manufacturers and Repairers, Indianapolis, Ind.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.



Stearn's Hollow Augers

and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

BILLINGS & SPENCER COMPANY, Manufacturers of

Clamp Lathe Dogs.

And Hardened.

A First-Class Article, and something that every machinist and Tool Maker will appreciate.

WROUGHT IRON AND STEEL DROP FORGINGS

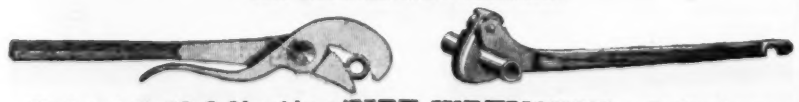
of every description. Machine Handles, Lathe Wrenches, Thumb Screws, Milling Machine Cranks, Spanners, Parts of Sewing Machines, Guns, Pistols, Drill Chucks, and MACHINERY GENERALLY.

TRADE B MARK.

THE BILLINGS PATENT SEWING MACHINE SHUTTLE,

Thirty Varieties now made, Forged Solid from Bar Steel and Cold Pressed. Also,

The Barwick and Wheatcroft



Patent Self-Adjusting PIPE WRENCHES, of all sizes.

Illustrated Circulars and Price List sent to any order on request. Lawrence St., Hartford, Conn

E. M. Boynton,

80 Beekman Street,

NEW YORK,

Manufacturer of

Saws of all kinds.

Also Sole Manufacturer of

LIGHTNING SAWS.

Two Direct Cutting Edges, instead of one Scraping point.

Note extra steel and durability over the old **V**, outlined on **M** tooth.

Telegram Dated Oct. 1st, 1874.

STATE FAIR, EASTON, PA.

To HENRY DISSTON & SONS:

Philadelphia, Pa.

I want you to publicly test that challenge on Cross Cut Saws. Name time and place within thirty days. American Institute preferred. E. M. BOYNTON.

E. M. Boynton gave on Wednesday of last week an exhibition of what his Lightning Saw could do at the Pennsylvania State Fair, in which two men sawed through a sound oak log, 16 inches in diameter, in 17 seconds. Mr. Boynton informs us that his export trade is increasing, he having lately made large shipments of his saws to Australia and other distant markets.—*The Iron Age*, Oct. 8, 1874.

For fuller report of this exhibition see the *Easton Morning Dispatch* of Oct. 1st, 1874.

Henry Disston & Sons cannot furnish Lightning Saws. Why do they imitate mine?

J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

Putnam's Government Standard

FORGED

HORSE SHOE NAILS.

Manufactured from the best of **NORWAY** Iron, and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,

NEPONSET, MASS.

Rogers' Self-Sharpening HOE.

The best Hoe in market. It will not batter or break. Wears itself sharp. Will last twice as long as any other Hoe, and is warranted to cut the "Bolles Hoe" or any Hoe in market.

For Sale at Manufacturers' Prices by

RUSSELL & ERWIN MFG. CO., - - New York.
BYRNE & FITZSIMONS, - - - - Albany, N. Y.
KENNEDY, SPAULDING & CO., - - Syracuse, N. Y.

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

303 Walnut St.,

PHILADELPHIA

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves, and firms connected with us, viz.

A. Pardee & Co.	HAZLETON, CRANBERRY, SUGAR LOAF
G. B. Markle & Co.	JEDDO, HIGHLAND.
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OFFICES:

WM. LILLY, Mauch Chunk, Pa.
WM. MERSHON, Agent, 111 Broadway N.Y
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WHEELER, MADDEN & CLEMSON,

Manufacturers of Warranted Cast Steel

SAWS

of every description, including

Circular, Shingle, Cross Cut, Mill, Hand, Roberts' and other Wood Saws, &c., &c

Cast Steel Files

of the well known brand of

Wheeler, Madden & Clemson.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

BRUNDAGE FORGED HORSE NAILS,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

WHEELER, MADDEN & CLEMSON

Middletown, Orange Co., N. Y.

make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

Properly Hammered.—Great care is taken that no saw shall leave my works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, cannot be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of myself, who has devoted over *twenty years* to the art of saw making.

I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

JAMES OHLEN.

V. G. HUNDLEY,

105 Reade St., N. Y.

NORTH CAROLINA HANDLE CO.,

(Wilson & Shober, Props.)

Manufacturers of

AXE, PICK, GERMAN & AMERICAN SLEDGE, and other Handles.

Full assortment always on hand.

VAN WART, SON & CO.

Hardware Commission Merchants,

BIRMINGHAM, - ENGLAND,

Agents,

VAN WART & McCOY,

134 & 136 Duane Street, N. Y.

George H. Gray & Danforth,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

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OSCAR IRVING VAN WART & Co.,

FORWARDING AGENTS.

2 South John Street, LIVERPOOL.

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(Formerly JOSHUA SCHOLEFIELD & SONS.)

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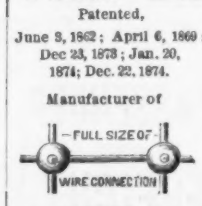
Boston—H. L. Richards, 18 Batterymarch, Street.
New Orleans—R. Rhodes, 71 Camp Street.
Montreal—J. J. Evans 14 St., John Street.

JOHN MAXHEIMER,

Patented,

June 8, 1862; April 6, 1869; Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.

Manufacturer of



JAPANNED and PATENT EUREKA Bright Metal

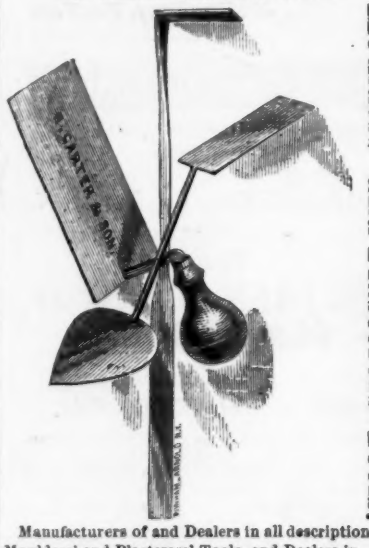
BIRD CAGES.

Nos. 247 & 249 Pearl Street NEW YORK.

H. CARTER,

290 PEARL ST., NEW YORK.

Moulders' and Plasterers' Tools.



Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in

General Hardware, Gilded Copper Weather Vanes,

CARTERS' PATENT CARRIAGE LIFTING JACK, &c

Backus's Patent Bit Brace

AND

Angular Extension

BORER.

Q. S. Backus,

SOLE MANUFACTURER OF

ANGULAR EXTENSION BORER.

Salesroom, 82 Chambers St., N. Y.

This tool can be used in any brace, at any angle, and also for straight work. Is the best and most convenient tool of its kind ever offered to the public. Eight thousand sold the first year.

Also Manufactures the Straight Extension

Backus's Pat. Improved Bit Brace.

The socket is arranged so that the strain does not come on the jaws, but on the square hole which fits the shank of the bit. The jaws attached to the sleeve hold the bit firmly in the square, and center it truly. The sweep is of wrought iron. The general finish of the stock is good. Its appearance is neat. Mechanics who have used it unanimously pronounce it superior to all others; and we offer it to the trade as the strongest, most simple, and quickest operating brace in the market. We manufacture five sizes. The number of inches of sweep corresponds with the commercial number of the bit.

The Law of Trade-Marks and their Analogues.

BY ROWLAND COX, ESQ.

II.

The analogue of the trade-marks generally understood to be embraced within the term consists of a grouping of woods or symbols, or both, and is most frequently in the form of a label, or applied as a "brand" by means of a stencil plate and brush. If the reader will turn to the advertisement of the Brooklyn White Lead Company, upon another page, he will find a very happy illustration of the point under discussion. The circular picture is in no true sense a trade-mark, and yet it is susceptible of the same protection, and as certainly the property of the parties employing it, as if it were the most sharply-defined symbol. To present a more radical illustration, let us examine an allocation arranged as follows:

WARRANTED
PERFECTLY
PURE WHITE
LEAD TRY IT
WETHERILL

Any manufacturer would have a perfect right to mark his goods "warranted perfectly pure white lead, try it," and place his name below; but no one could arrange and combine these word, or any other words, as shown, without an invasion of the supposed right of Mr. Wetherill. To perfect the illustration, we digress far enough to show the principle by an example of what would be an infringing device, in which nearly all of the words in the foregoing are avoided:

UNADULTER
ATED WHITE
LEAD EXTRA
USE IT ONLY
ROBINSONS

In this allocation we have the same effect upon the eye, a reproduction of the *tout ensemble* of the original, and a consequent invasion of the right of property of the owner of the same.

We shall have occasion to further distinguish the classes into which the subject has been divided, but may now return to a consideration of the qualities of the legal mark.

In addition to the points touched upon in the preceding paper, it is requisite that the trade-mark involve no fraud or misrepresentation, and so comprehensive is this doctrine that it includes the entire genus, controlling every branch of the subject. The doctrine finds its origin in the settled maxims of equity, which preclude a court of conscience from in any wise countenancing that which is, in the generally accepted sense of the words, immoral or untrue.

Any statement which the trade-mark itself implies, or which results from the incidental words or devices that accompany it, which is false or deceitful, will utterly vitiate the right. It is of no consequence that the misrepresentation is of an innocent character, or that its fictitious nature is disclosed by circumstances; unless the untruth be so palpable as to be shorn of all possibility of misleading, an otherwise valid mark will not be protected. There are numerous cases which fully illustrate this doctrine, and which have so clearly defined it that there is little probability of its ever undergoing any material change.

As the decisions are all to the same effect, a few of the more recent are selected. One of the most famous is what is known as the "Balm of a Thousand Flowers case" (Fetridge *v* Wells, Cox's Am. T. M. cases, 180), in which Judge Duer, whose great opinion in the Amoskeag case has made his views of especial value, entered very fully into a discussion of the rule, and sought to fix a proper limit. The defendants mark was "Balm of Ten Thousand Flowers," so that there was no question as to the infringement, provided the other objections could be overcome. The decision was that the plaintiff was attempting to lead the public to believe that he was really offering a distillation of the oils of natural flowers, whereas, the facts were that his "precious mixture," as it was called, was a compound of noxious and injurious drugs. It was in vain urged that no one would imagine that the "balm" was made up of the distillations of a thousand plants. The court refused the injunction, and took occasion to administer a severe rebuke to both the parties.

The case of Palmer and Harris (Ib. 523), decided by the Supreme Court of Pennsylvania, illustrates a highly important point. Palmer made "Golden Crown" cigars in New York, and used a label which held out that they were made in Havana. Harris, also, made "Golden Crown" cigars, and hence the suit. The defence was that Palmer could not have protection because it was a fraud to sell cigars made in New York as cigars made in Havana, and the court so ruled.

But perhaps the most important case on the topic of misrepresentation is the Leather Cloth Companies case (Ib. 688), which was carefully considered by the House of Lords, and which is a precedent of acknowledged force. Without reciting the facts, which were quite complicated, it will suffice to state that it was held that marking an unpatented article patented was a species of deceit that would preclude the interposition of a court of equity. The opinions in this case are of more than ordinary importance, and the reader will find in them a very satisfactory discussion of the question chiefly at issue.

Numerous other adjudications might be mentioned, but those alluded to go far enough to fortify the view advanced. It is not unsafe to assert that wherever there is untruth, there is no redress for the infringement of a trade-mark. The rule is as certain and comprehensive as principle and precedent can make it.

But, as above intimated, there may be a use of word-marks which, although a false use, is free from objection. This happens where the word does not really bear its usual signification, but is invested with a secondary meaning that gives it the character of a purely fanciful, arbitrary designation. Thus "Alaska Files" could by no possibility lead any one to suppose that the files were manufactured in Alaska. Or, if the word "Arabian" was applied to steel, no one would infer that the steel came from Arabia. In such instances their would be no deceit, for, to all the intents and purposes, the works would have no significance as geographical terms. They would be merely fanciful, and as such valid trade-marks. But apply the word "Alaska" to furs, or the word "Arabian" to any product of Arabia, and they become invested with their true significations, and, losing their character of fancy names, lose, at the same time, their validity as trade-marks.

It is also essential that the article to which the mark is applied be one that is not injurious or subversive of morality, or the sale of which is contrary to public policy. Thus it has been often held that marks upon what are known as "quack medicines" could not be sustained, and the same has been decided in respect of adulterated liquors. But it is necessary to clearly establish the fact of the immoral nature or tendency of the article to make this objection effectual. All known goods which are permitted to be sold are presumably free from any taint, and it is only where there is a departure from their recognized nature and uses, and the introduction of some deleterious element that changes their character, that they will be regarded as subversive of morality or injurious. To illustrate, the vending of terra alba as such would involve no wrong; but to sell a mustard or cinnamon, a large percentage of which was terra alba, would be to perpetrate a fraud, and the courts would decline to second it in any manner. Usually, as in the case of Fetridge & Wells, above alluded to, there are misrepresentations as to the qualities and objects of the article, but where these are not found, the fact that it is calculated to injure those who make use of it will be sufficient to defeat any attempt to protect the marks which serve to assist in its production and consumption.

The Prevention of Railway Accidents.

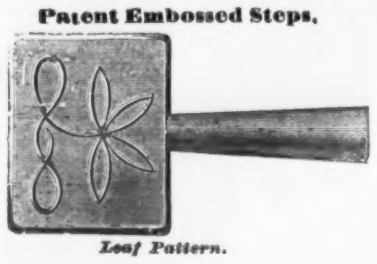
The *Railway World* says:

The importance of some of the modern improvements in railway mechanics is illustrated by events connected with a recent accident on the Philadelphia, Wilmington & Baltimore Railroad. While a passenger train was running at a rapid speed, the locomotive suddenly overturned and fell across both tracks, and while it continued to slide forward for a distance of about 50 feet, a scene of terrible confusion and danger ensued, the tender being broken from the trucks, the baggage car overturned, and the Pullman car, which came next in the train, being thrown upon its side and jammed into the rear end of the baggage car, while two following cars were also overturned. The cause of the accident was the displacement of a rail, and it is supposed this occurred in consequence of the loosening or breaking of a plate, or "fish," by which it had been secured at a joint. The practical lessons suggested are: first, that improvements in the appliances for fastening rails to the tracks are needed; and, second, that the strength of the modern passenger cars frequently saves life. The Baltimore *American* says: "There can be no doubt but that the new mode of building cars contributes greatly to the safety of the passengers when a 'run off' occurs. The Pullman cars, parlor cars, and even the ordinary coaches used on the principal railroads, are exceedingly strong. A sleeping or drawing room car costs from $20,000 to $25,000, and a great deal of this large sum of money is expended in bracing and strengthening the ends and sides. The polished veneering which attracts so much attention is merely the ornamental covering that hides a frame-work almost as strong as the sides of a ship. When these splendid coaches are thrown from the track they are often sadly defaced, but they are rarely broken to pieces. The strong oak ribs hold together, and although the passengers are tossed about rather roughly, they are not crushed and mangled by broken timbers. In the 'run off' on the Philadelphia, Wilmington & Baltimore Railroad, on the 19th inst., nobody was hurt, although three coaches crowded with passengers were thrown from the track. The train was running at the rate of 25 miles an hour, and when the tremendous speed was suddenly checked the concussion was terrible, but the frame-work of the cars held together, and, except some slight contusions, the passengers suffered nothing more than a great fright. The cars were dragged along the ground for a short distance, but even this rough test did not change their contour, although the windows and panels were considerably broken. There can be no doubt that the lives of the passengers were saved by the great *strength* of the coaches. It is also said that the 'Miller platform' acted admirably, and prevented the 'telescoping' which would have been inevitable if the cars had been weak and the platforms of the ordinary pattern."

Improved Varnish for Special Purposes.—Moreau, of Paris, patents the following improved varnish: Infuse 195 grammes of gum sandarach in one-fourth liter spirits of wine; also, 120 grammes spirits of turpentine in three fourths litre spirits of wine. Stand the two infusions in a water bath for half an hour; then mix, and place the mixture in the water bath for fourteen minutes more. Allow it to stand for twenty-four hours, and filter through cotton. The result is a colorless varnish, which may be given any desired tint with saffron, Prussian blue, indigo, etc. The patentee states that the effects resemble those formerly produced by the famous "Vernis Martin," the secret of which is now lost.

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



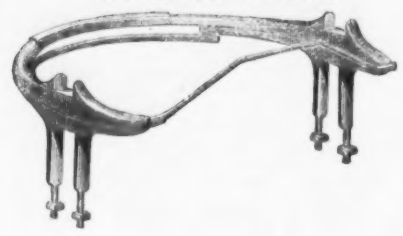
Leaf Pattern.

Star Pattern.

Established 1850.

King Bolt Yokes.

No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.

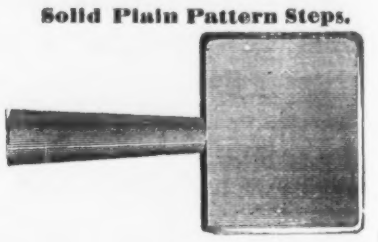
Patent Cross Bar Steps.

Upper View.

Lower View.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



MANUFACTURERS OF A LARGE VARIETY OF FIRST-CLASS

FORGED CARRIAGE IRONS.

Send for Price List.

FORT PLAIN SPRING & AXLE WORKS

CLARK, SMITH & CO.,

Green Jacket Axles. FORT PLAIN, N. Y. Fine Carriage Springs.

MANUFACTURERS OF

English and Swedes Steel Springs, and Iron and Steel Axles.

Execute orders promptly for

Black, Bright, Tempered and Oil Tempered Springs,

Of any Pattern or Style. Also for **AXLES of any description, from a COMMON LOOSE COLLAR to the FINEST OF STEEL.**

Our facilities for manufacturing are very extensive, and with our recent additions of new and improved Machinery, we defy competition.

Send for Price List and Descriptive Circular.

CARRIAGE BOLTS.

Buy the Best.

Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not turn in its place.

MANUFACTURED BY

CLARK BROS. & CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &c

Send for Illustrated Price List

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Ho House Pullies, Composition Cocks, Bench Screws, Vise Screws Gridirons, Drill Stocks and Bows, Box Chisels, Rivets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and Genera Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,

Warehouse, 97 Chambers and 81 Reade Streets, N. Y.

HOOPES & TOWNSEND,

Manufacturers of

MACHINE & CAR BOLTS,

Cold Punched Square & Hexagon Nuts,

Washers, Rivets, Wood or Lag Screws, Chain Links, Truck and Car Forgings, Bridge Bolts, Bridge Forgings.

IRONS AND RODS FOR BUILDINGS.

1330 Buttonwood Street. PHILADELPHIA.

CONCORD SPRING WORKS,

J. PALMER & CO.,

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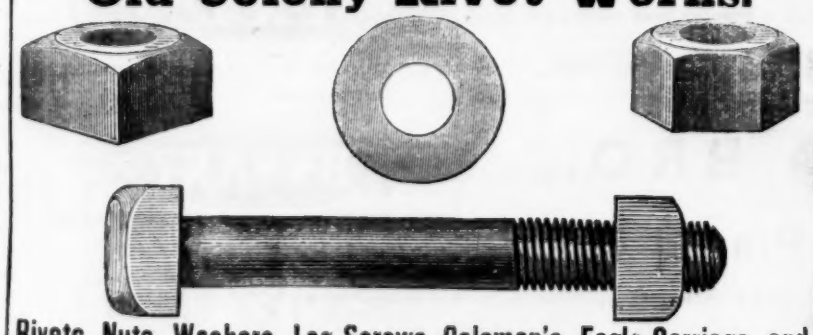

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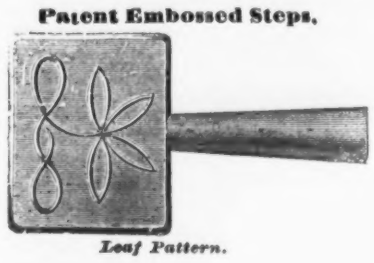
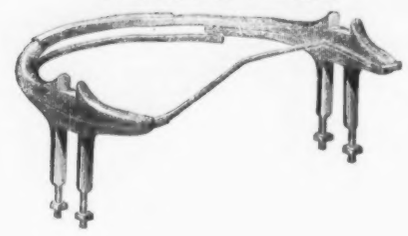


Leaf Pattern.

Star Pattern.

King Bolt Yokes.

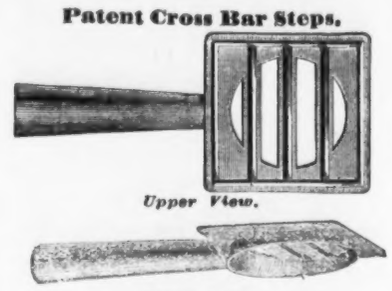
No. 6 Fifth Wheels.



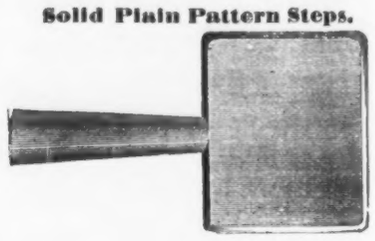
1871 Pattern Shaft Couplings.

Smith's Improved Philadelphia Pattern Slat Irons.

Patent Cross Bar Steps.



Solid Plain Pattern Steps.



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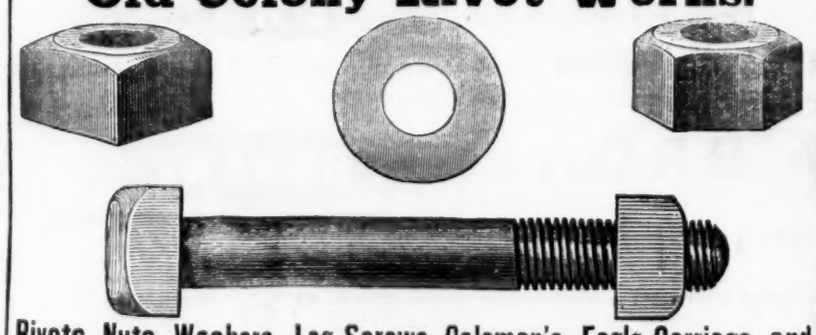

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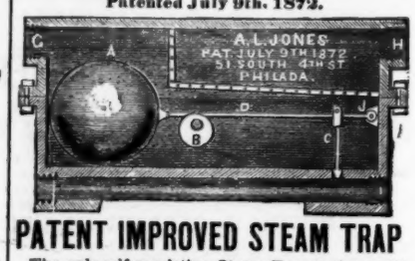

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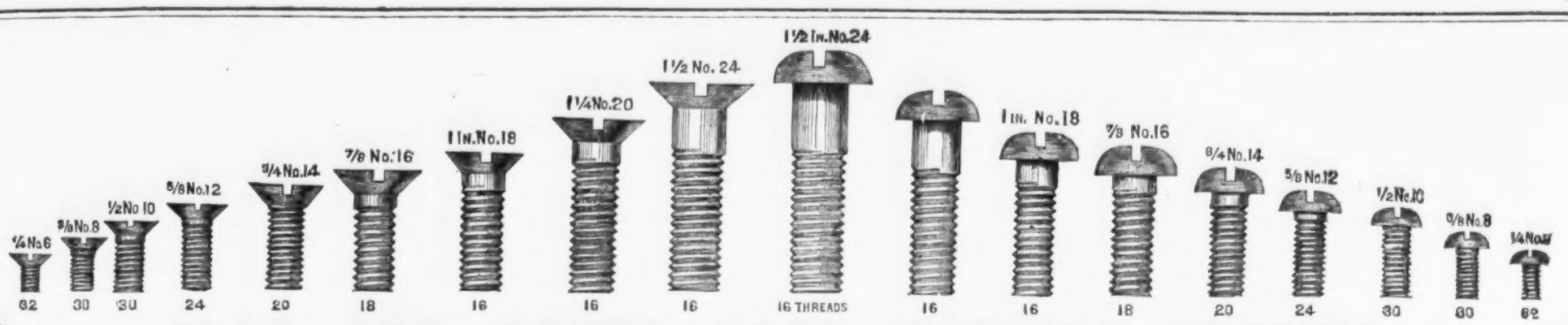

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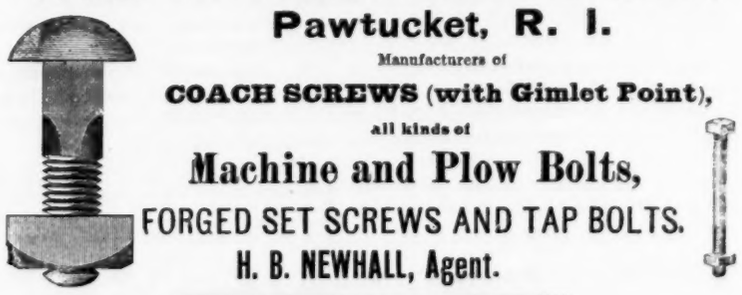

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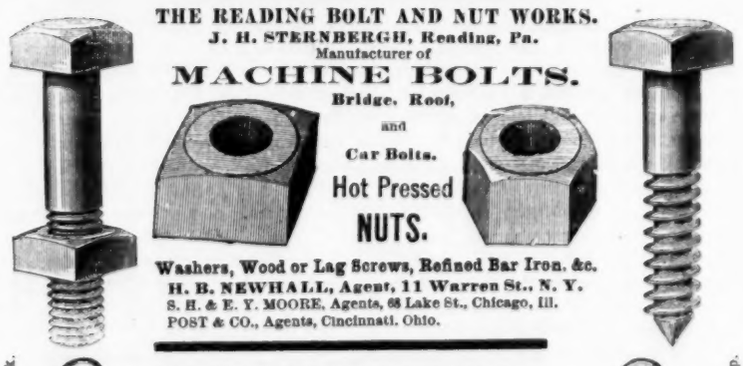

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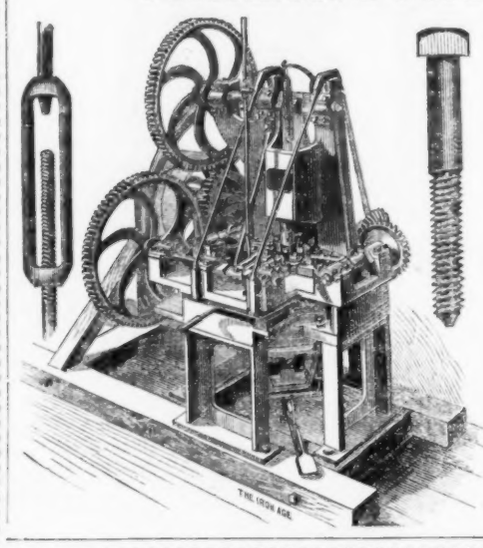

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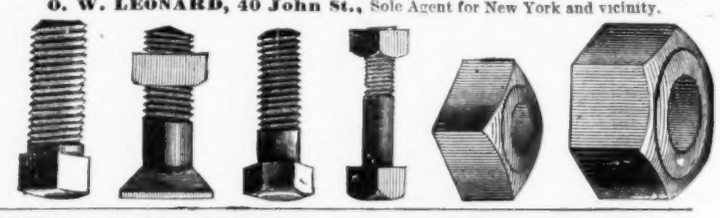
O. W. LEONARD, 40 John St., Sole Agent for New York and vicinity.



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The Iron Age.

New York, Thursday, April 8, 1875.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

NEW YORK, January 2, 1875.

Until the 1st instant the postage on newspapers was paid by subscribers at the office where the paper was received, the yearly rates on the different editions of *The Iron Age* being as follows: Weekly, 40 cents; Semi-Monthly, 40 cents; Monthly, 24 cents.

Under the provisions of the new postal law, which went into effect on the 1st instant, prepayment at the office of mailing is required, at the rate of two cents per pound for the Weekly, and three cents per pound for the Semi-Monthly and Monthly, which will make the postage as follows on the different editions: Weekly, 80 cents; Semi-Monthly, 30 cents; Monthly, 15 cents.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age;* also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

The Pennsylvania Railroad Default.

The position of the Pennsylvania Railroad Company, which was so favorably reported upon by a committee of its stockholders a few months ago, has been seriously compromised by its default in payment of the guaranteed interest on the first mortgage bonds of the Columbus, Chicago and Indiana Central Railroad. As the default is one of considerable importance, both in the amount and its effect upon the public confidence, our readers will be interested in a brief resume of the facts of the case, which are somewhat peculiar.

To secure a through route to Chicago, the Pennsylvania Railroad Company entered into a compact with the Pittsburgh, Cincinnati and St. Louis Company, and the C. C. and I. C. Co., on the 22d of January, 1869, by which the latter was leased to the former, the Pennsylvania Railroad guaranteeing the payment of interest on the first mortgage bonds of the leased road, and further agreeing to provide a sinking fund for the final liquidation of its bonded debt. The article of the agreement by which the Pennsylvania Railroad Company became responsible, as stated, is as follows:

ARTICLE 16.—And the party of the third part, for and in consideration of the sum of one dollar to it in hand paid by the parties of the first and second parts, the receipt whereof is hereby acknowledged, and of the benefits and advantages accruing and to accrue to it by reason of the covenants and agreements hereinbefore recited, by the said parties of the first and second parts, to be done and performed in the forming, maintaining, and operating of a continuous line of railway in connection with the road or roads of the party of the third part, does hereby guarantee to the party of the first part that the party of the second part will, in good faith do, keep and perform, all and singular, the matters and things which the said party of the second part have hereinbefore covenanted and agreed to do; and upon any failure or default of the said party of the second part to keep and perform any and all of its said covenants and agreements, that then the said party of the third part will, upon notice to them in writing of the kind and nature of such failure or default, do, keep and perform the same, for and on behalf of the said party of the second part. In which event the parties of the first and second parts agree that the party of the third part shall, at its option, be entitled to all the profits and advantages which might or could accrue therefrom to the party of the second part.

In July of the same year the Pennsylvania Company leased the P. Ft. W. and C. Road, which rendered the previous arrangement with the C. C. and I. C. Co. less desirable than it had been before the lease was consummated. The lease of the latter road was accordingly amended on the 1st of February, 1870, by which the original lessee again agreed to pay interest regularly on the $15,000,000 first mortgage bonds of the C. C. and I. C., the P. R. R. continuing the guarantee. The portion of the amended lease in which this payment is guaranteed, on the part of the P. R. R., reads as follows:

ARTICLE 2.—That hereafter the party of the second part covenants and agrees to pay and apply the thirty per cent., being the balance of the gross earnings of the railroad of the party of the first part, as follows:

First—For the payment of the coupons as they shall from time to time mature upon the said bonds representing, and amounting to the aforesaid sum of $15,821,000. But if the same shall not be adequate to such payment in full in any one year, then the said party of the second part will pay any such deficiency out of its own proper moneys, without charge, reclamation or subrogation therefor.

As further proof that the guarantee was given in good faith, and with a view to inducing capitalists to purchase the C. C. and I. C. bonds, the following letter was written by Mr. Thompson, president of the P. R. R., and Mr. Jewett, president of the P. Ft. W. and C. R. R.:

To Messrs. W. R. Fosdick and James A. Roosevelt, Trustees, and A. Parkhurst, Trustee: GENTLEMEN: Under the contract and lease of the Columbus, Chicago and Indiana Central Railway, dated January 22, 1869, as amended by the contract of February 1, 1870, the Pittsburg, Cincinnati and St. Louis Railway Company, as lessee, which lease the Pennsylvania Railroad Company has guaranteed, will, by the terms of said lease, pay the interest as it matures on the $15,000,000 of the first mortgage consolidated bonds of the Columbus, Chicago and Indiana Central Railway Company, or on the bonds which they represent; and on $821,000 of the second mortgage bonds of the Columbus and Indianapolis Railway Company, which bonds are secured by deeds of trust made respectively to you.

You are, therefore, authorized to inform the holders of said bonds, and to give such further public notice as you may think proper, that the interest on the said $15,821,000 of bonds will be regularly paid by the Pittsburg, Cincinnati and St. Louis Railroad Company, according to the tenor of said amended contract and lease.

Yours, very respectfully,
J. EDGAR THOMPSON, President.
THOMAS L. JEWETT, President.

Philadelphia, Pa., December 1, 1870.

Under these seemingly ample guarantees, the managers of the C., C. & I. C. caused their first mortgage bonds to be stamped with the printed assurance that the interest was guaranteed by the P. R. R., and on the strength of this assurance they were bought with confidence by capitalists. Thus far none of the facts are disputed. For a time the profits of the C., C. & I. C. road were sufficient to nearly, if not quite, cover the interest guaranteed, but the road has latterly become a burden, and, owing to an enormous, and as yet unexplained, increase in the expense account, the net earnings of the line decreased from $1,040,231 in 1871 to $233,183 in 1873. The figures for 1874 are not obtainable, but it is probable that they are even less favorable. This, seemingly, is the only excuse which can be advanced in extenuation of the course adopted by the P. R. R. Co. in repudiating its obligation. It is possible, as has been suggested, that the P. R. R. can manage to take advantage of some flaw in the lease by which to escape the necessity of making good its guaranty, but we should be sorry to see a company occupying so high a position in the public confidence resort to a trick which would cast a doubt upon the honesty of its management and the value of its pledges. We have had too much of this already in American railroad management, and we should be sorry to see the Pennsylvania Railroad classed with those corporations which consider no obligation binding which chances to be burdensome. We do not doubt that the Pennsylvania Company have made many mistakes in carrying out their policy of extension and expansion, and that it would gladly relieve itself of many obligations assumed to defeat rival combinations or to secure certain temporary advantages over competing lines; but it cannot afford to seek relief in the repudiation of obligations which are morally binding, if not legally, in a strict and technical construction of the letter of the law which violates its spirit.

Anarchy in the Anthracite District.

That the great strike in the Anthracite region is drawing to an end, is the opinion of those on the ground who are best acquainted with the situation of affairs in the mining districts. It is pretty generally understood that the operators will not concede the demands of the miners, and it is obvious that they are in a position to make a protracted and effective resistance. The miners, on the other hand, though no more willing now than when the strike began to accept the terms offered, are not in a position to maintain a long struggle. Their resources are limited and are already beginning to give out, and as the men are brought face to face with the disagreeable but inevitable necessity of submitting, they are beginning to manifest the temper and disposition of men rendered desperate by imaginary wrongs and self-imposed privations. The sportive deviltry which they have manifested for the past fortnight is giving place to a desire to do serious mischief. In the towns of the mining districts they are congregated in surly, ominous mobs, every man bearing concealed weapons, and it only needs such provocation as may be given at any hour to make them a terrible and, under existing circumstances, practically irresistible power for destruction to life and property. It is, apparently, the policy of the leaders of the movement to keep the men in a constant state of excitement. Processions are kept marching day and evening, headed by responsible officers of the union, scouting and raiding parties are kept out all the time, a system of intimidation is maintained over all who are suspected of a disposition to work at the operators' terms, or who may be induced to do such work as is necessary to keep the mines in running order; in short, the men are kept busy at something which is just short of actual rioting, and in their present temper it will take but slight provocation to induce them to vent their wrath on the persons and property of the mine owners and managers. Were a riot once begun, there is no telling where or when it would stop. The women are even more uncompromising partisans of the union than the men themselves, and are far more bitter in their hatred of those whom they consider the oppressors of the workingmen. What assistance and encouragement they would lend in a general riot can be better imagined than described.

That the miners have as yet done no serious mischief cannot be accepted as giving any guaranty for their future conduct. They have already done enough to make it the duty of the State to take extraordinary measures to preserve the peace and protect life and property within the mining districts. There are at least two counties in which the local authorities are utterly powerless to maintain more than a show of authority, which the miners do not respect, and in which the citizens have no confidence. In case of trouble they would be wholly unable to protect either life or property, and any resistance they might offer to a mob would only stimulate the men and women to deeds of violence not now contemplated. Knowing their power, the men make no effort to conceal their plans or purposes. They known that the failure of the strike would weaken the influence of the union, if it did not break it up altogether, and rather than submit peacefully to defeat they have threatened to leave marks upon the operators and everything belonging to them. No one who knows the miners will question their willingness to carry out their threat if incited to it by any act or circumstances which rouses them to destructive activity. They may not carry out their threats; but as it now is, property to the value of many millions of dollars, and the lives of many useful citizens, are at the mercy of men who would not hesitate to sacrifice both life and property if they imagined that such a course would make them more terrible to the operators and strengthen the power of their union to control the coal trade. The danger is one which cannot be trifled with. In the more populous sections of the coal district order has given place to anarchy of the most irresponsible kind—the anarchy of an armed mob; and the governor has done wisely to send troops into the mining country. Should this course anger the miners and bring about a collision, the effect would be beneficial in the end. There must be a bloody conflict sooner or later, before the miners can be made to respect the law, and if it should come now there will be less occasion for apprehending future trouble. The turbulent element of the mining population has too long enjoyed immunity from restraint at the hands of the civil authorities, and, should a collision occur, we hope the troops will make the occasion memorable by a judicious distribution of cold lead among the rioters.

Industrial Disorganization in Great Britain.

If there be any truth in the proverb that "misery loves company," those of our manufacturers who have been made unhappy by slow sales and small profits during the past two years, may derive all the satisfaction they can from the knowledge that their British competitors are suffering the same misfortunes to an even greater extent, though from somewhat different causes. In Great Britain the troubles of the manufacturers result chiefly from the strikes of the workmen, who seem bent upon ruining the employers and driving capital out of manufacturing and into other and safer investments, at any cost to themselves and without any regard whatever to their future inferests. Whether the market for manufactures is strong or weak, whether the tending of prices is up or down, makes no difference to the British workingman. If he makes up his mind to strike, nothing will change his determination. As the rule, he seems to prefer the unwise and misleadingc counsel of professional "agitators" to the teachings of experience or the warnings of his better judgement. Intoxicated by the high wages of the past three or four years, the miners and iron workers cannot realize that any change has taken place in the iron trade which makes a reduction in wages a necessity. As a consequence, they meet every effeort on the part of employers to reduce wages with a dogged and stubborn resistance. As a consequence, Belgian makers are competing successfully for iron and steel orders in the English markets. This, however, has no effect on the men. The threat of foreign competition seems to have lost all terrors for the British workingman. In South Wales it is said that 100,000 miners are standing idle, and in other parts of the country troubles of a kindred nature, though of less serious character, are reported. In many of the principal iron manufacturing districts work at furnaces and mills is in great part suspended, causing an advance in prices which makes it a comparatively easy matter for foreign manufacturers to secure large contracts. Much the same condition prevails in trades other than those connected with iron and steel manufacture. The woolen mill owners of the Dewsbury and Batley districts complain bitterly of German competition in the London market, and are compelled to reduce prices as soon as they can induce their operators to accept lower wages. This they have thus far declined to do, and the result has been a lock-out of some 25,000 of them, mostly women. And so it goes. The English manufacturers are seriously alarmed for the future, and are beginning to consider whether, after all, a larger customs revenue, with incidental protection, and less internal taxation would not be a good thing for the country. Those to whom the condition of English trade is a matter of interest will find the weekly letter of our English correspondent—who is a very intelligent and well informed gentleman, and well acquainted with all departments of the iron business—uncommonly entertaining reading just now.

Recent Business Developments in Europe and America.

The protracted winter on both sides the Atlantic, paralyzing the revival of legitimate trade and checking speculation in merchandise, has led to the resuscitation of large operations on the various stock exchanges, fostered as it has been by the extreme ease in money matters. As soon as the political excitement in the French Assembly began to subside, an era of wild speculation began, which has not had its parallel since 1852. A bold operator, a Belgian by the name of Philippart, began to operate on the Paris Bourse, and has been setting everybody crazy, since everything he touches seems to be converted into gold. His dealings have been partly in Spanish funds and partly in railway securities, the former most apt to fluctuate by reason of the precarious political situation in the Peninsula, and the latter most promising, owing to the vast amounts of money about to be expended on strategical railroad lines by France, Germany and Russia. The wars of the past fifteen years have shown that strategical lines of railway are as important an element of success in warfare as good generals, large and well disciplined armies and perfected fire-arms. But while this comprehensive system of strategical lines replaces the old network, the latter it still benefited by the construction of branches through most densely populated districts. On the German lines alone there were added and ordered between January 1, 1874, and March 1, 1875, in the shape of rolling stock, no less than 1549 locomotives, 1670 passenger and 17,905 freight cars, representing altogether $40,000,000 in gold. An immense transit traffic, stimulated by the opening of the Isthmus of Suez route, is growing up in Central Europe; the trade which existed prior to the doubling of the Cape of Good Hope in 1498, is gradually being restored, and will be even better re-established after the St. Gothard in Switzerland shall be tunnelled. While this is going on in Central Europe, France in a westerly direction and Russia in an easterly, develop the same activity. That the prospect of increased railroad earnings should stimulate speculation in securities is therefore but logical, hence the revival of the wide-spread mania we have alluded to.

On the other hand, iron, steel, and metals in general, cannot long resist being influenced by the increased consumption that is going on. Steel seems to be singled out especially, inasmuch as the replacing of iron rails by steel is going to be more extensively carried on than ever. The revival of the speculative era in Europe will no doubt soon embrace all the leading metals; it has, indeed, begun to take charge of tin already, although thus far with varying success, to be soon followed, we presume, by a combination to restore copper to where it was in November last. We do not hail the advent of another period of wild speculation with unqualified satisfaction, but we willingly admit that the movement seems to have begun under circumstances promising a fair degree of success. There has been an almost total absence of overtrading, both in Europe and America, for the past eighteen months, the crops have been bountiful in both hemispheres, politics wear a quiet aspect, money is abundant and at a moderate rate of interest, and if there be any rivalry between nations it is for the moment in trade and industry.

What we have said about the aspect in Europe applies in a great measure, also, to the United States. Here, too, bold operators have undertaken to revive the era of speculation on the stock exchange, based upon arguments which, if not well founded as regards the activity in railway building and equipment, are not lacking in plausibility, so far as the reasonable supposition is concerned, that we are about entering upon a period of greater material prosperity, and that the elements for it are sounder and likely to last longer than at any previous time since the war. Although legitimate trade and industry may deprecate stock speculation and its influence on business and the public morals, it cannot be denied that what has been going on in that market for the past six weeks shows sufficiently that sagacious financiers are alive to the favorable change dawning upon us. From all indications thus given us, it is fair to presume that metals in general will not long remain depressed, and as prices are unusually low, the inference is that a more active demand, both for consumption and speculation, will soon cause them to appreciate.

The following table compares the market value of the five principal metals of commerce, other than iron, at the close of March, 1874 and 1875:

March 31.	1874. Currency.	1874. Gold.	1875. Currency.	1875. Gold.
Lake copper	24¾c.	21⅞c.	21⅜c.	18⅝c.
Domestic lead	....	6½c.	....	5⅞c.
Straits tin	....	24½c.	....	21 c.
Domestic spelter	7¼c.	6⅝c.	6⅝c.	5¾c.
Antimony	....	13½c.	....	12¼c.

From this it will be seen that metals are unduly depressed. One year ago we were suffering much more severely than now from the effects of the panic. We are now recovering from the depression which followed that stunning blow to our material prosperity, and we think it requires no unusual sagacity to predict an advance in the price of metals which will render judicious speculation in them both safe and profitable. Any permanent improvement must, of course, depend upon legitimate consumption, and as this gives promise of a steady and sustained increase, the metal markets must soon feel the impulse of the new life which already thrills in the sensitive pulses of trade.

A New Plan of Heating.

Once in a while the manufacturers of stoves and furnaces receive really valuable suggestions from writers who do not know much about stoves, but who are crammed full of the tallest kind of science. We do not mean to say that all which these gentlemen are pleased to write concerning heating and heating apparatus, is really valuable, for sometimes their suggestions are a trifle impracticable, even though strictly scientific; but, as we said before, once in a while they give the stove manu-

facturers a bit of advice for which they are entitled to no end of gratitude, to say nothing of liberal pecuniary compensation. For example, we find in an esteemed scientific contemporary, an article so valuable that we cannot refrain from publishing it entire, to the end that the stove manufacturers of the country may see it:

To burn fuel economically, it is necessary to burn it centrally and in a mass. The coal that would supply a number of separate fires would furnish an immensely greater amount of heat if burned in a single furnace, a fact more or less recognized in every contrivance for heating houses by hot air, hot water or steam. But in all such arrangements it is deemed essential to distribute, not heat directly, but matter more or less highly heated. In other words, we first heat our air or water, and trust to the cooling of that to furnish the heat required, overlooking the well-known fact that heat will travel alone quite as well as in company, and it can be much more easily controlled than air or water.

Radiant heat, the sort required for perfect heating, obeys the same laws as light. By proper arrangement of reflectors and lenses, heat radiations can be massed into beams of parallel rays and sent where we will, with little or no wasting. It is not until the radiations are arrested that they become manifest as heat, a fact put to practical use 2000 years ago, when Archimedes burnt the fleet off Syracuse with mirrors. A stream of heat vibrations, intense enough to fuse gold, would pass through a stream of ice without affecting it, provided the air in the tube be sufficiently pure and dry. There appears to be no good reason, therefore, why we should not warm our houses by the direct distribution of pure heat, and so gain all the benefits of an open fire in each room, with none of its disadvantages.

Briefly described, the plan would involve (1) a central furnace, constructed, of course, with a view of the development of the greatest amount of heat to a given amount of fuel. (2) A system of tubes leading to the different rooms, terminated by radiators in each room. (3) A system of reflectors to throw the heat of the furnace into the conducting tubes in parallel rays, with other reflectors at the bends and angles of the tubes to direct the course of the radiations properly. The radiators in the rooms might be placed so that every portion would be flooded with light, yet no part be heated beyond what would be enjoyable. As nothing would enter the room from the furnace save pure heat, the effect would be like that of a room warmed by direct sunshine. The surplus heat of the furnace might be utilized in warming, say, to 50° or 60° Fahrenheit, and an abundant supply of fresh air let in from out doors, a steady circulation being kept up from the ventilating chamber, through the rooms, by the draft of the furnace. We should have then (theoretically) perfect heating combined with perfect ventilation, and, at the same time, the most economical combustion of our fuel.

Possibly there may be mechanical difficulties to prevent the successful carrying out of a plan of house heating of this sort. We do not anticipate any, and the advantages it promises, on the score of health, comfort and economy, certainly justify its trial by any one possessing the requisite means. The plan could be easily tested in the laboratory of any institution having a few lenses and reflectors.

We agree with our contemporary that, possibly, there may be certain mechanical difficulties to prevent the successful carrying out of this idea. Indeed, if we should be called upon to express our humble opinion on this point, we should say it was open to that objection. There can, however, be no doubt of its great advantages over any other system yet proposed or tried for economically heating buildings. We say economically, because it is quite likely in practice that the reflectors would become so hot that they would continue to pour out a gentle radiance long after the fire in the furnace had gone out; and because our apartments would be flooded with light without extra expense. There is only one point upon which we are left in doubt. Our contemporary speaks of "pure heat." What is the difference between pure heat and impure heat? What is heat, anyway? Accepting the fact, however, that common heat is impure, although we confess ourselves unable to explain it, we would venture to offer a suggestion which would seem to be all that is needed to make the plan perfect. Would it not be well, in carrying out the new system, to pass the streams of reflected heat flowing from our registers through blocks of ice. This would filter out any impurities which *might* be in the heat, and we could warm ourselves without the necessity of bathing immediately afterward. Ice is generally cheap in the winter time, and we do not think the inventor of the new system need be deterred from adopting our suggestion because of the increased expense it would involve. In case this filtration should reduce in any material degree the luminosity of the "pure heat," we might light up in another way. A good plan would be to employ Polish exiles in the manufacture of polarized light, which could be sold by the barrel, and distributed through houses in the gas pipe by means of force pumps.

The Cleveland Car Wheel Foundry.

A Western paper, describing the establishment of Messrs. Bowles, Maher & Brayton, Cleveland, Ohio, says of the car wheels there made: In the manufacture of wheels the utmost care is taken to have the metal of best quality for the purpose, tests being made of every lot drawn from the cupola, and higher or lower grade metal added when necessary to obtain just the quality desired. With each wheel is also cast a slug to show the quality of the metal, and this slug accompanies the wheel until the wheel is marketed, so that the quality of the iron is subject to inspection at any time. In no case is a wheel permitted to pass which is not of the exact grade desired. The iron used is Salisbury and Lake Superior charcoal, selected especially for the purpose.

Three cupolas are used in the wheel foundry, and one hundred wheels can be made each day. The annealing is carefully looked after, and it is seldom that a wheel is turned out which is not perfect.

A ten ton cupola is in use in the miscellaneous casting foundry, where there is every facility for making castings of any description, including large size steam and blowing cylinders, heavy bed plates, driving and balance wheels, columns, &c.

A great deal of work has been done at this foundry for the Cleveland & Pittsburgh Railroad, the Lake Shore and Michigan Southern, and all the roads running into Cleveland, as well as many others East and West, and it is a gratifying fact that stock is not allowed to accumulate, as articles manufactured are ordered away as fast as completed. Sixty men are now employed in the various departments.

Missouri Lead Boulders.

The Springfield, Mo., *Vidette* says:

On Saturday, last Joseph and William Burnett, Jr., who were engaged in taking up zinc for the Dade Company, struck, at a distance of only four feet from the surface, a chunk of lead which has not yet been taken up, but has been uncovered sufficiently to show that it is six feet in width, about two feet in thickness, and, so far, about nine feet in length. Parties who have examined it estimate its weight at from 25,000 to 30,000 pounds. The discovery of this mammoth mass of mineral was the occasion for intense excitement among the miners in that vicinity. Some 60 or 70 have applied for lots on which to prospect for lead, and quite a number have already commenced prospecting without the formality of a lease or of any writing whatsoever. It is reported that the zinc mines at Engleman's Mills are almost deserted, every miner being anxious to make an early trial of his luck in digging for lead. There are a number of experienced Joplin miners present, all of whom unite in the opinion that the prospect for lead in immense quantities is excellent. The company has determined to survey 50 acres more of this tract into lots. These lots are 99 x198 feet, and it is proposed for the present to let each alternate lot to miners. A large number of prospectors will therefore soon be at work, and there is good reason for believing that the mines of Dade county will soon be exporting lead in nearly as large quantities as zinc.

Since the above was in type we learn that another immense lead boulder has been struck in a shaft some 40 yards from the first one. The shaft is about 6 feet in diameter, and the lead covers the entire bottom of the shaft, so that its length, breadth and thickness can only be guessed at. The miners are wild with excitement.

Iron Piers.

At the meeting of the English Society of Engineers, held during the first week of the present month, a paper was read by Mr. J. W. Wilson, Jr, on "The Construction of Modern Piers," from which we make the following notes and extracts:

"The construction of piers for the purposes of promenade and of embarkation is a subject of considerable interest to the engineering profession. The rapid growth of watering places around our coast, and the necessity for extending their attractions, have led to the erection of these structures at most of the important seaside places. As the arrangement of the material employed is very varied, and as some of these piers have had to be erected in the most exposed situations, being thus subjected to the full force of ocean waves, the author desires to contribute such general and statistical information as he possesses upon this subject, and to impart his experience in the erection of several piers involving special points of construction."

Before proceeding with his subject the author devoted some little time to the description of the *toredo navalis*, or "ship worm," so destructive to timber. No allusion, however, was made to the terrible havoc which the worm makes with all timber exposed for any length of time under water. The appearance of piles taken from southern waters, after 12 or 14 months of exposure, is that of a honeycomb in which the cells are irregularly arranged. The strength of the wood is, of course, utterly destroyed, the timber appears perfectly sound on a casual examination, but generally the minute holes where entrance was effected may be discovered on careful examination. Hard pine is sometimes so perfectly honeycombed as to be almost as light as so much cork. In the specimens which we have seen the holes are nearly the size of a common lead pencil, winding and twisting in all directions through the wood. The ship worm is found in almost all oceans, and though in the extreme North do not give much trouble, yet the destruction of wood by them is only a matter of time, even as far north as the coast of Maine. After leaving the description of the worm, the author takes up the subject of timber piers:

"In the early days of pier and similar construction, timber was almost exclusively employed, in ignorance of, or notwithstanding, the depredations of the teredo; this material being more readily procured than others, and the manipulation of it being so much more generally understood and easily accomplished. Various expedients have been tried from time to time for protecting timber in water, but the interesting discussion upon this subject at our meeting last October, showed the failure of all modes known up to the present time for its preservation to any satisfactory extent. As time progresses, and new works are carried out, timber is seen to enter to a continually diminishing extent into the ordinary formation of their substructure, and in addition to this the necessity of a rectangular form, and the necessarily extensive surface exposed to the force of the waves, is a further reason for substituting a stronger and more durable material, notwithstanding the consideration of the admirable adaptability of timber for bearing the constant blow of the waves, it being so much more elastic than cast iron, and yielding so well to the frequent blows given to it in all directions. We are thus led to the consideration of iron as a substitute for timber in the substructure of pier work.

"The chief principle of modern pier erection may be said to be the reduction as much as possible of the area of resistance offered to the waves by the pier or structure itself by the employment of ironwork, wrought or cast, in the water or elsewhere, in order to combine the greatest amount of strength and stability with the least possible resistance to the force of the waves. In other words, the modern requisite is maximum stability, in combination with minimum dimensions, thus affording opportunity for many interesting details of solidification combined with contraction of design, whereby excellent scope is afforded for the ingenuity of the engineer.

"The piles first introduced in furtherance of this object were hollow castings, of convenient length, and cylindrical in form, by which means the same surface became exposed to the action of the waves, whatever might be the direction of the blow. Although by this means it was possible to greatly reduce the sectional area of the supports, it was necessary to provide an extended base of sufficient area for the support, in an adequate manner, of the substructure, and superincumbent load. The first piles of this kind terminated with a flat plate beneath, for the reception of which an excavation was provided of the requisite depth and capacity in the fore-shore, into which the piles were lowered, and the excavation was then refilled above. By this means, however, the ground become of necessity much disturbed, and the next improvement was the introduction by Mr. Mitchell of his screw piles. These were made originally in the form of short, simple screws, being cast with a square recess in the center, and designed for being carried upon an ordinary timber pile, being furnished beneath with a spiral taper screw of smaller diameter, and serving the purpose of a lead, for facilitating the entrance of the pile. When, however, cast iron became a more general substitute for timber in this work, the screw pile and column were formed in one continuous length. It was soon found, nevertheless, that great difficulty was experienced in erecting these continuous rigid lengths in the exact line of direction required, and this led to their subdivision into piles below and columns above, the piles being enlarged in the form of a socket in the upper part, of octagonal form externally, for convenience in sinking, and internally cylindrical for the reception of the lower ends of the columns. These lower ends had a circularly projecting head to afford a means for the firm combination of the pile and column, the interstice having three or four wrought iron wedges, and being filled in between with iron cement or other material suitable for the purpose. It is still customary either to sink the lower end of the piles a certain depth in the ground and replace the material excavated, or to heap some convenient substance over them in order to facilitate their entrance into the solid earth, and when once fairly started it is an easy matter to continue the downward motion to the requisite depth.

"The idea has been entertained that cast iron was liable to corrosion, and consequently to deterioration, in a similar manner to wrought iron, but experience proves that this is not the case, or only so to a trifling extent, owing to the material difference in the nature of the two substances, one being fibrous and the other crystalline, from which it results that the external corrosion of the cast work, and the vegetable growth which soon makes its appearance upon the submerged surface, afford great protection to it, retarding almost entirely the continuous oxidization to which wrought iron falls so speedy a victim.

"Perhaps the most ordinary construction for modern piers consists of a circular hollow cast iron screw piles, supporting hollow cast iron cylindrical columns, braced diagonally or otherwise by wrought iron bracing, in compression or in tension; these in turn sustain a timber superstructure. There are, however, various other descriptions which are frequently employed. It is not unusual to meet with a combination of various different materials in the same work. For instance, a pier, the body of which is of the ordinary cast iron construction of screw piles and columns, may carry a timber head; or a timber body may be supplied, either at first, or, as is frequently the case, at a subsequent period, with an iron head; and this again may be either cast or wrought."

The writer gives the following dimensions of a type of pier common on the English coast:

"The deck of the pier is 16 ft. in width, and is composed of open 9 in. planking, 2½ in. thick, running longitudinally, and spiked down to transverse joists, 11 in. by 2½ in., placed 5 ft. apart. These joists are supported upon two parallel 12 in. by 12 in. baulks extending throughout the body of the pier, at a distance apart of 13 ft. from center to center. In lieu of a railing on either side, seat standards are supplied, fitted with timber seats, and forming sitting accommodation throughout the entire length of the work. They are of cast iron, placed 5 ft. apart, one upon each joist at each end, and the back of the standard is filled in with four rails, the upper one being formed of 2 in. wrought iron tubing, and the lower ones of ordinary 1 in. round bars.

"The body of the pier is subdivided lengthwise into bays of 30 ft., the long baulks supporting the deck resting at either end upon timber corbels 10 ft. in length. Beneath the center of these corbels the load is taken by a cast iron spreading bracket, the lower flange of which is firmly bolted to the upper end of the cast iron column. These columns terminate in cast iron screw piles entering the ground, each pair of columns inclining inward at the top, and being held in place in an upright position by a horizontal 4 in. tee iron extending across the structure above, and another similarly below. The longitudinal 30 ft. baulks are doubly trussed by 1½ in. wrought bars, one on each side, and where the fall of the foreshore necessitates a stronger form for the supports in the deeper water, nests of four piles are substituted for pairs of columns, these being braced quadruply, and carried out in a second set below the first, if required.

The author next directs attention to the different species of piles and columns, which are examples of the various descriptions in use at the present day. Among the more important and useful of these are: "Dixon's cast iron piles designed for the purpose of driving in foreshores where the ordinary screw or driven timber piles would be otherwise employed. They are usually of about 8 in. internal diameter, and 1 in. thickness, of metal, cast in the form of a hollow cylinder with four projecting ribs running the entire length of the piles, the external diameter over the flanges being 14 in. The principal objection to driving cast iron piles was the liability of the material to fracture under concussion, and this Mr. Dixon entirely avoids by the employment of a wooden dolly above the head of the pile. This is turned to fit the interior, and shouldered so as to rest upon the socket, a ring of india-rubber, or some other yielding compressible substance, being inserted between this shoulder and the iron, to deaden the concussion. By this means it is found that these piles may be safely and successfully driven to a great depth."

What the author calls Dowson's wrought iron columns seems to vary in no particular from the circular flanged columns extensively manufactured in this country. They are in quarters bolted together by external flanges. These quarters, bolted together alternately convex and concave side up, are frequently employed for the covering of bridges and other similar works, in cases where it may be an especial object to economise headway. For combination it will be seen that these plates form a very good and rigid piece of work, very similar in form to the cast iron construction. The Dowson piles are usually of an internal diameter of 8 in., the width over all of a single plate being 8½ in., The thickness of the plates from which they are rolled is ⅝ in., or thereabouts, and the thickness of each plate, laid flat, is from 1½ in. to 1⅝ in.

In connection with certain forms of columns composed of charcoal iron and flat bars, invented by Mr. J. G. Wilson, the author's father, a cast iron pile was used. Mr. Wilson describes these piles as follows:

They were of cast iron, and in section circularly hollow. They were of an external diameter of 9 in., immediately below the upper flange, and increased gradually in diameter to 11½ in. at the lower extremity. The total length was variable, according to the section of the foreshore, and the distance of the pile in the rock was 3 ft. 6 in. The metal of the pile in the upper part was 1¼ in. in thickness, and this gradually increased until, at a point 6 in. below the surface of the rock in which it was sunk, the thickness of metal was 4 in. on either side. From this point the contracted opening in the center of the pile gradually expanded, the metal being reduced to 1 in. in thickness at the lower extremity. By this means a pile was obtained of sufficient rigidity for the wrought iron superstructure, and one which was free from the objections in wrought iron piles. The holes sunk in the rock for the reception of these piles were of 13 in. diameter, and they were sunk parallel downward, the surrounding interstice being filled with cement, giving a perfectly solid foundation to the superstructure. The piles were also filled up to ground line internally with cement concrete. The body piles of this pier were of similar construction to the head piles, the flange at the top being replaced by an ordinary octagonal socket for the reception of a cast iron column. A plan by Mr. Brunless is now frequently adopted for the purpose of obviating the screwing of piles in foreshores in which sand is the principal ingredient. The piles in question are of cast iron, and of ordinary diameter, having the base extended considerably to afford sufficient support for the superstructure, and finishing at the lower extremity in a greatly contracted opening of from 2 in. to 3 in. diameter. This enlarged base bears toothed edges, in order to pass freely any interposing layer of hardened mud, or clay, or other obstacle. A tube of iron passes down the center of the hollow pile or column, of such a diameter as to fit the small opening below in the disc base beyond which it extends for a short distance. The upper end of this tube is placed in connection with a pliable hose, by which means communication is established with some convenient pumping power, and the whole apparatus is supported as found most convenient, according to circumstances. On pumping being commenced with the pile in position, the sand is disturbed or blown up on all sides by the downward force of the constant stream supplied, and the pile rapidly descends, and a constant reciprocation supplied at the same time by an external contrivance, prevents clogging and aids the descent. The pumping is suspended as soon as the necessary depth is considered to be reached, and the tube being extracted from the interior, the disturbed sand immediately surrounding the pile gradually settles down and becomes quite solid. Piles may be sunk by this means to a depth of 17 ft. or 18 ft. in from 20 to 30 minutes, according to circumstances.

"The process above described may be equally well carried on upon the foreshore itself, or from a raft; and this plan of sinking is claimed as being the only one by which such depths are reached with piles containing such a minimum of metal.

"Localities are frequently met with where the nature of the situation, the excessive rise and fall of the tide, the exposed position of the structure or some other reasons necessitate the elevation of the deck to a greater hight than is ordinarily the case. In such instances it is becoming usual to employ wrought iron work to a much larger extent than formerly, not only in the superstructure, but much more in the supports to the work themselves. As an instance of this may be mentioned the pier erected at Clevedon, in Somerset. There is a rise and fall of tide there of nearly 46 ft., and wrought iron may be called the exclusive material of which the work is constructed, there being considerably less than 10 tons of cast iron employed, while there are said to be upward of 350 tons of wrought work in the structure in all. The main part of this structure is formed of two wrought girders formed of plate work, and extending in two parallel lines continuously throughout the work, and the pier is divided into eight bays of 100 ft. each, being supplied with a tee head 42 ft. broad and 50 ft. long. The depth of these girders is 3 ft. 6 in. The columns employed were formed from combined pairs of Barlow rails riveted together, and extended above the ground to a hight of no less than 65 ft. They were connected with the shore—which the author believes to consist of hard limestone covered with mud in a moist state, interspersed with loose rocky blocks—by means of a solid wrought iron bar extending in a downward direction as far as the solid rock, a distance of somestimes 14 ft. or 15 ft. The bar had at its extremity a cast iron screw of upward of 2 ft. diameter. Thus, in this work the total length over all, of pile and column, reached in some instances as much as 80 ft. The stability of the structure is further increased by the rails forming the columns being convergent, and being bent over at the top in either direction, by which means is formed an arch of great rigidity. The total length of Clevedon pier over all is 842 ft., and the breadth of the body 20 ft. At low-water spring tides the depth of water at the head is 6 ft. The cost of the pier was £10,000, giving a cost per superficial foot of deck 11 0¾."

The following comparative statements of the cost of several examples of modern pier work are taken from actual practice. Five of the examples cited, namely, Bognor, Hunstanton, Teignmouth, Starcross and Westward Ho, have occurred in the author's own practice in conjunction with his father. The statement shows how the prices of construction and erection may be considerably affected in various localities, and by various other contingent circumstances. It must be borne in mind that the price per foot super given below can only be taken as affording a comparative guide to the general cost of the structure, being calculated as it is from a price which included the whole work complete from beginning to end, and including entrance gates, toll houses, structures on pier head, &c.:

Bognor Pier.—Total length, 995 ft.; width of deck, 19 ft. At low water spring tides the distance from the head to the water line is 600 ft. Total cost, £4975; cost per foot superficial, 5/2¾; per foot forward, £5. This pier is almost entirely devoid of ornamentation, and has a simple timber toll house in the center of the approach. *Hunstanton Pier.*—Length, 806 ft.; breadth of body, 16 ft.; length of head, 90 ft.; breadth of head, 30 ft.; distance from end of head to line of low water springs, 900 ft.; total cost, £6500; price per foot super, 9/6; price per foot forward, £8. 2 6. *Teignmouth Pier.*—Length, 600 ft.; length of body, 495 ft.; length of head, 105 ft.; breadth of head, 50 ft.; breadth of body, 18 ft.; greatest depth of water at low spring tides, 1 ft.; total cost, £7000; price per foot super, 10/1½; price per foot forward, £11. 13 4. *Douglas Pier, Isle of Man.*—Total length, 1000 ft.; length of body, 880 ft.; breadth of body, 17 ft.; length of head, 90 ft.; breadth of head, 40 ft.; greatest depth of water at low spring tides, 2 ft.; total cost, £6000; price per foot super, 6/2¾; price per foot forward, £6. The body of this pier is composed of two parallel plate girders 18 in. by ⅝ in. by 30 ft. long, supported on 9 in. cast iron piles. *Portobello Pier.*—Length, 1230 ft.; length of head, 180 ft.; breadth of head, 60 ft.; breadth of body, 30 ft.; greatest depth of water at low spring tides, 6 ft.; total cost, £9500; price per foot super, 6 2½; price per foot forward, £7. 15 1½. *Starcross Pier.*—Total length, 1307 ft.; length of head, 390 ft.; breadth of head 32 ft.; length of body, 1252 ft.; breadth of body, 18 ft. 6 in.; greatest depth of water at low spring tides, 16 ft. 6 in.; total cost, £11,000; price per foot super, 4/10; price per foot forward, £8. 8 3¾. *Westward Ho! Pier.*—Length, 493 ft.; length of head, 86 ft.; breadth of head, 52 ft.; breadth of body, 16 ft.; greatest depth of water at low spring tides, 3 ft.; total cost, £4390; price per foot super, 7 8½; price per foot forward, £8. 18 /. *Southport Pier (original).*—Length, 3600 ft.; length across head, 100 ft.; breadth of head, 30 ft.; breadth of body, 16 ft.; distance from end of head to line of low-water springs, 500 ft.; total cost, £8000; price per foot super, 3/7; price per foot forward, £2. 10 /. This pier had only 7 in. columns, was constructed entirely on dry ground, had only one small entrance house 9 ft. square, and two flights of steps at pier head. Contractor's price for cast iron fixed complete was £8; wrought iron, £14; and the contractor's loss was £2000. *Southport Pier present. Outer Portion of Structure.*—Length, 805 ft.; greatest breadth of head, 190 ft.; total length of head, 135 ft.; length of body, 640 ft.; breadth of body, 29 ft.; greatest depth of water at low spring tides, 13 ft.; total cost, £16,000; price per foot super, 11 1½; price per foot forward, £19. 17 6½. The body of this pier is supported upon Dixon's cast iron driven piles, the head is of timber construction piles, 12 in. by 12 in. This pier started from what was the head of the orignal pier. Total cost of pier, not including tramways, £34,642; price per foot super, 5/8¾; price per foot forward, £7. 18 4¾. *Eastbourne Pier.*—Length, 924 ft.; length of head, 100 ft.; breadth across head, 125 ft.; length of body, 824 ft.; breadth of body, 17 ft.; greatest depth of water at low spring tides, 6 ft.; total cost, £13,400; price per foot super, 11 2½; price per foot forward, £14. 10 ⅜. *Scarborough Pier.*—Length, 1000 ft.; length of head, 150 ft; breadth of head, 50 ft.; breadth of body, 20 ft; greatest depth of water at low spring tides, 6 ft.; total cost, £13,000; price per foot super, 11 ¼; price per foot forward, £13. "*Marbella Pier, Spain.*—Length, 1000 ft.; length of head, 200 ft.; breadth of head, 15 ft.; breadth of body, 14 ft.; total cost, £12,000; price per foot super, 17 /; price per foot forward, £12.

Phosphor Bronze, and its Uses.

The constantly increasing competition in every branch of industry, and the very general introduction of machine tools, has necessitated the utmost care in the selection of metal for bearings and certain other portions of machinery, in order to avoid the annoyance and inconvenience of frequent stoppages for repairs and readjustments, so that for some years past the production of improved alloys combining toughness and hardness in the degrees requisite to ensure durability, according to the particular purpose to which it may be applied, has received a large amount of attention from inventors, one by one of whom have had to give way to a more successful rival. At the present moment phosphor bronze seems to be the best alloy it the market, and although it is, perhaps, unreasonable to suppose that perfection has been reached, it cannot be doubted that in point of durability it leaves little to be desired. It must not be forgotten, however, that its high quality is in a great measure due to the extreme care taken with its manufacture, so that other inventors may hereafter discover that by giving equal attention to the manipulation of other alloys correspondingly good results may be obtained, with even greater economy. With regard to first cost, the price of phosphor bronze is from 30 to 40 per cent. higher than that of gun-metal composed of about four parts copper with one part tin, but, placed in the very trying position of a railway carriage bearing, it has been found by actual and long continued trial that £1 worth of phosphor bronze will outwear £4 worth of the gun-metal, so that the economy in favor of the former is enormous.

The extensive application of phosphor bronze is due to the circumstance that it can be made more ductile than copper, as tough as wrought iron, or as hard as steel, according to the purpose for which it is required, not the least advantage being that these properties are given to it in the process of manufacture, and that once given they are permanently retained, although the mass may be remelted and refashioned by the consumer. It is claimed that its homogeneity is complete, and its grain is as fine as the best cast steel. The phosphor bronze alloys made for rolling, drawing, or embossing, will stretch more than copper or any of its ordinary compounds. Plates have been reduced by a single cold rolling to one-fifth of their thickness, the edges remaining perfectly sound, and without cracks. The great advantage of phosphor bronze for bearings is that, in addition to wearing well, it does not readily become heated, the general result being that they wear five times as long as ordinary bronze. For locomotive and boiler tubes phosphor bronze has proved much superior to copper or brass, owing to its greater hardness or strength. Used as bell metal, the phosphor bronze gives a clearer and louder ring than any other compound; and, as the clappers can be made heavier, a greater volume of sound can be produced without the risk of cracking the bells. The new alloy has likewise been successfully employed for wire, its great toughness and immense strength, combined with its non-liability to rust, making it particularly applicable for pit-ropes, standing rigging, &c.

In connection with the use of phosphor-bronze wire rope in collieries, the report of Prof. Spangenberg, of the Berlin Academy of Arts and Sciences, upon some systematic experiments made by him, is of considerable interest, as establishing the enormous strength of the alloy. In testing three bars of forged phosphor bronze which were expected to be of extreme toughness, the trials he made, however, showed a more moderate and unequal resistance than the unforged phosphor bronze; but, on the other hand, produced a most unexpected and gratifying result by its immense resistance to torsion. The first bar which he tried resisted, without rupture, 3,871,500 bends right and left, at a strain of 14 tons per square inch; 1,996,900 bends ditto, 15 tons per square inch; and 1,590,000 ditto, 16 tons per square inch=7,458,400 bends to the right, and the same number to the left. As the springs of the machine were too weak to increase the strain, Prof. Spangenberg was compelled to substitute a slighter bar, which has, up to the present moment, resisted as bravely as its predecessor, having until now withstood, without rupture, 500,000 bends right and left, at a strain of 15 tons per square inch; 600,000 ditto, 16 tons per square inch; 400,000 ditto, 17 tons per square inch; 494,000 ditto, 18 tons per square inch=1,994,000 bends to the right, and the same number to the left. As soon as the special machine is repaired, the Professor will continue the experiments—firstly, by completing the 2,000,000 bends, and afterward increasing the strain to 19 tons. After each 500,000 bends right and left, he proposes to increase the strain up to 20 tons, and so on, until a rupture is effected.

As the value of experiments of this kind can only be judged of by the general reader by comparing the results obtained in similar experiments with other metals, Prof. Spangenberg mentions that a bar of Westphalian iron broke after 215,653 bends in each direction, at a strain of 12 tons per square inch, and that in Wohler's experiments with a bar of Krupp's cast steel, taken from an axle, the number of bends which it resisted was 273,800, at 10 tons strain per square inch; 258,800 bends, at 11 tons strain per square inch; 201,100 bends, at 13 tons per square inch; 251,850 bends, at 13 tons strain per square inch; 187,500 bends, at 14 tons strain per square inch=1,258,050 bends in each direction. This bar, therefore, at an average strain of 13 tons, resisted 1,250,000 bends; another, at a strain of 13 tons, about 1,000,000 bends; while, according to his showing above, one bar of phosphor bronze resisted 7,500,000 bends, at an average strain of 18¼ tons, and is not yet broken; and the second and slighter bar has up to the present resisted without rupture nearly 2,000,000 bends, at an average strain of 16½ tons. As soon as the second trial is completed the professor will commence a third, and then several other trials, to make sure that the successful results described above are not in any way attributable to accident.

The mining and metallurgical industries are likely to take a prominent position among the consumers of phosphor bronze, for already the new alloy has been advantageously employed for blast furnace tuyeres, and will, doubtless, come into favor hereafter for pit ropes, tamping bars, prickers, and many mining tools which hitherto have been necessarily made of steel, though much danger has attended their use. It appears that tuyeres for blast furnaces, &c., made of phosphor bronze have given great satisfaction in England and Wales, and particularly in France and Germany, where they are in general use. They are known to be much more durable than tuyeres made of any other metal, some having after three years' service been found in a perfectly good condition. For tamping bars phosphor bronze would appear to be invaluable, since they may be made as hard as steel, yet have the same advantage as copper in not emitting sparks. The application of phosphor bronze in the manufacture of rock drills was mentioned at the recent meeting of the Phosphor Bronze Company, and there really appear to be few cases in which really hard work is required where it would not prove economic.

Standard Sizes of Steam, Water and Gas Pipes.

The manufacture of wrought iron pipes and fittings for water, steam, and gas distribution, has grown to such a magnitude as to take its place among the leading industries of the age. The great and increasing demand for them requires that the numerous details with respect to sizes and interchangeability of parts should be thoroughly classified and reduced to a system, as a matter of saving economy both to manufacturers and consumers; and this has already been done to an extent which leaves little margin for improvement. It has had the effect of suggesting, in machine shop practice, many advantages to be derived from similar methods, and is probably the origin of the standard sizes of screw threads, bolt heads, and nuts.

We have, in view of all this, and for the convenience of our readers, compiled from various sources the following table, showing the sizes of threads and pipes, which, from some inadvertence, appears to have been left out of the hand books of the day:

Inside Diameter.	No. of Threads per inch of Screw.	Actual outside Diameter.	Thickness. Ordinary Strength.	Thickness. Extra Strong.	Thickness. Double Extra Strong.	Actual Inside Diameter. Ordinary Strength.	Actual Inside Diameter. Extra Strong.	Actual Inside Diameter Double Extra Strong.	External Circumference. (All Strengths of Pipe.)	External Area. (All Strengths of Pipe.)	Length of Pipe per square foot of outside surface. (All Strengths of Pipe.)	Internal Area. (Ordinary Strength of Pipe.)	Length of Pipe per square foot of inside surface. (Ordinary Strength of Pipe.)	Length of Pipe containing one cubic foot. (Ordinary Strength of Pipe.)	Weight per foot. (Ordinary Strength of Pipe.)
In.	Th'ds	In.	In.	In.	In.	In.	In.	In.	In.	In.	Ft.	In.	Ft.	Ft.	Lbs.
1/8	27	0·405	0·068	0·100	....	0·270	0·205	....	1·272	0·129	9·44	0·0572	14·15	2500	0·243
1/4	18	0·54	0·088	0·123	....	0·364	0·294	....	1·696	0·229	7·075	0·1041	10·50	1385	0·422
3/8	18	0·675	0·091	0·127	....	0·494	0·421	....	2·121	0·358	5·657	0·1916	7·67	751·5	0·561
1/2	14	0·84	0·109	0·149	0·298	0·623	0·542	0·244	2·652	0·554	4·502	0·3048	6·13	472·4	0·845
3/4	14	1·05	0·113	0·157	0·314	0·824	0·736	0·422	3·299	0·866	3·637	0·5333	4·635	270·	1·126
1	11½	1·315	0·134	0·182	0·364	1·048	0·951	0·587	4·134	1·357	2·903	0·8627	3·679	166·9	1·670
1¼	11½	1·66	0·140	0·194	0·388	1·380	1·272	0·884	5·215	2·164	2·01	1·496	2·768	96·25	2·258
1½	11½	1·9	0·145	0·203	0·406	1·611	1·494	1·088	5·969	2·835	2·01	2·038	2·371	70·65	2·694
2	11½	2·375	0·151	0·221	0·442	2·067	1·933	1·491	7·461	4·430	1·611	3·355	1·848	42·36	3·667
2½	8	2·875	0·214	0·280	0·560	2·468	2·315	1·755	9·032	6·491	1·328	4·783	1·547	30·11	5·773
3	8	3·5	0·217	0·304	0·608	3·067	2·892	2·284	10·996	9·621	1·091	7·388	1·245	19·49	7·547
3½	8	4·0	0·226	0·321	0·612	3·548	3·358	2·716	12·566	12·566	0·955	9·887	1·077	14·56	9·055
4	8	4·5	0·237	0·341	0·682	4·026	3·818	3·136	14·137	15·904	0·849	12·730	0·919	11·31	10·728

In estimating the effective steam heating or boiler surface of tubes, the surface in contact with air or gases of combustion, whether internal or external to the tubes, is to be taken. For heating liquids by steam, superheating steam, or transferring heat from one liquid or gas to another, the mean surface of the tubes is to be taken. It is impossible to make iron tubes of exact internal diameter. All pipes of 1¼ inches diameter or less are butt welded and proved to 300 lbs. hydraulic pressure; 1¼ inches diameter and above are lap-welded and proved to 500 lbs. per square inch. The taper of all threads, 1 to 32 on each side, equal to 1-16 per inch of length.

How to Keep Hydrants from Freezing.—Mr. John Y. Culyer, the Chief Engineer of Prospect Park, Brooklyn, proposes a plan for preventing the freezing of street hydrants, the main features of which are, that they shall be placed below the surface of the sidewalk and be enclosed by either a brick chamber or cast iron cylinder, so that they can be easily gotten at. At the bottom of the chamber a pipe is to be placed leading to the sewer, by which all the water remaining in the hydrant after it is closed will be immediately conveyed away, and as all the water is admitted to the hydrant by a valve four feet six inches below the surface, there will be no chance for the water to freeze at that point. But as all hydrants are provided with a self-acting valve, by which the water above the main valve is removed after the hydrant is closed, it sometimes happens that this valve does not act, and this arrangement is intended to remedy the defect. Around the upper part of the hydrant it is proposed to place a pefrorated ring of gas-pipe, connected with the gas main, so that in cold weather the gas may be lighted and the hydrants surrounded by a circle of fire that will prevent any chance of freezing, or will remove any accumulation of ice and keep them in condition for immediate use. It is held that the ordinary supervision of the firemen will serve to keep the hydrants so constructed in the most efficient condition for use at the smallest cost.

The Production of Iron in Wisconsin.

The following paragraphs, are all taken from an interesting article on iron, in the March number of *Gilmore's Magazine*, by Chas. S. Peirce, of Peirce & Whaling. Mr. Peirce, as the head of one of the largest iron and hardware houses in the country, knows whereof he speaks:

The production of iron in Wisconsin since 1863 has steadily increased with the growth of the iron manufacture of the country. In 1863 the entire product of the State did not exceed 3000 tons, while in 1873 there was manufactured 75,000 tons pig iron and about 50,000 tons of rails. This was produced largely from Wisconsin ores, in addition to which there was shipped 31,000 tons ore to Chicago.

The grade of iron made of Wisconsin ores, with a two-fifths mixture of Superior ore, has proved very popular with the foundrymen of the State, and has in many instances superseded the use of Scotch pig.

The principal iron manufacturing enterprise of the State is the Milwaukee Iron Company, whose works are located at Bay View, adjoining Milwaukee. The company, with an invested capital of two and a quarter million dollars, produce annually 50,000 tons pig iron, and about 50,000 tons of rails and merchant bar, using in their production principally Wisconsin ore, and paying out annually over three quarters of a million dollars in wages.

The Minerva Furnace Company, of Milwaukee, which went into blast in the latter part of 1873, produced during five months of the year 5100 gross tons of pig iron, and has an annual capacity of 15,000 tons.

Seasons of activity are as sure to follow the depression of the past two years as the sun to rise, and these enterprises so successfully inaugurated must soon be followed by nail mills and manufactories of spikes, nuts, washers, and a great variety of coarser products of merchant iron.

The resources of Northern Wisconsin in iron ore are enormous, apparently inexhaustible, and their development, stimulated by the ever-increasing demand, must in future prove a source of wealth equal to, if not surpassing, that of any other industry of our State.

The total annual consumption of spiegeleisen by the eight Bessemer establishments in the United States, when fully employed, will not exceed 25,000 gross tons. It has never amounted to quite this quantity in any year. Most of the spiegeleisen used is imported. It is classed as ordinary pig iron, and pays duty as such. Only one company makes spiegeleisen, the New Jersey Zinc Company, of Newark, New Jersey, which has three furnaces, each 20 feet by 7 feet, with a combined annual capacity of 5000 gross tons. In 1872 they produced 4072 gross tons; in 1873, 3930 tons; in 1874, 4070 tons. The spiegeleisen made by this company is equal to the best that is imported, and is, therefore, readily sold. The following are two analyses of it:

Iron	83·250	83·22
Manganese	11·586	11·67
Phosphorus	0·196	0·19
Silicon	0·367	0·90
Carbon	4·632	4·02
	100·031	100·10

Pig iron that is rich in manganese and almost free from phosphorus, silicon and sulphur, is made at several furnaces in the country, but not of a quality that will, under present conditions, justify its use as spiegeleisen. The country, however, possesses an abundance of the ores necessary to produce all the spiegeleisen it may require, and some decided steps may be taken at an early day to render the Bessemer establishments entirely free from all dependence upon foreigners for a material so necessary to their prosperity.

Engineering pokes fun at *The Engineer* in the following bit of dry humor concerning a wet subject: "Our contemporary, *The Engineer*, in a leader in its last number on 'The Bessemer Channel Steamer,' announces that 'it has been shown that the taffrail of an American liner often falls through a vertical space of 30 feet in about one second when running in a heavy sea.' If not asking too much of our contemporary, we should like to know how, when, and where this 'has been shown.' We ourselves never heard of the deck of a vessel falling so rapidly that the men standing on it were left behind; but, if our contemporary be correct, this must be a common, although not ordinarily known, occurrence. Ordinary individuals, as well as all inanimate bodies with which we are acquainted, only manage to get through a space of a fraction over 16 feet during their first second when falling freely under the action of gravity, and if, therefore, an incautious sailor or passenger happened to be standing near the 'taffrail of an American liner' when that vessel was about to perform the remarkable gymnastic feat which our contemporary records, he would at the end of a second find himself situated 14 feet above the deck, surrounded by such loose articles as the deck near him might have carried before its descent! Our contemporary adds: 'The effect of such a drop as this is beyond all question more severe than anything rolling produces.' Quite right!"

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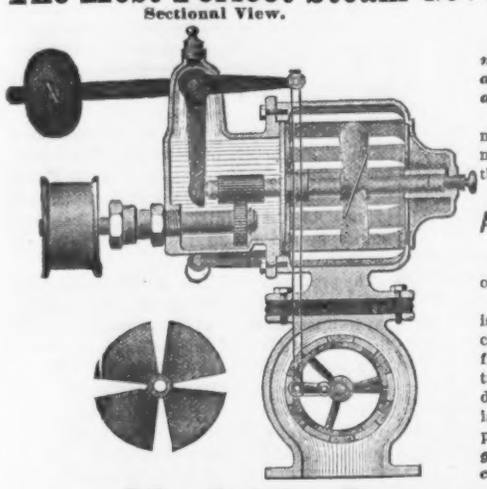

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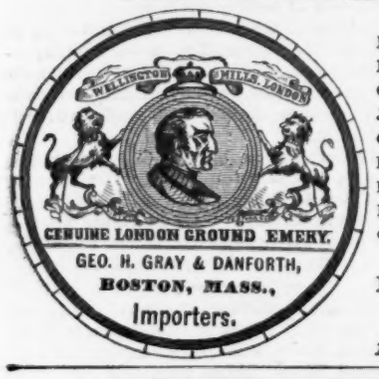

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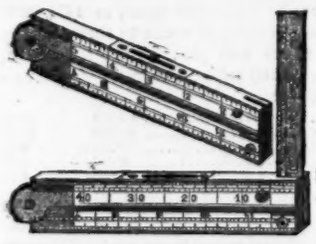

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Resistance of Rails.

M. Ch. Conche, Inspector-General of Mines in France, who publishes a valuable serial work on "The Permanent Way, Rolling Stock, and Technical Working of Railways," has, in his last number, taken up the question of the "Weakening of Vignolee Rails by the Notch of the Shoe."

Intermediate notches, although they diminish to a considerable extent the resistance of iron rails, especially against shocks, still leave a sufficient excess of resistance to make a breakage very rare on well kept lines. But the case is very different with Bessemer rails; then the dimunition of resistance is enormous. It is well to point out the state of a question, the importance of which has not yet attracted the attention of engineers. In testing iron rails with and without notches, by falling weights, the results P and H (the weight of the monkey multiplied by the hight found necessary to produce rupture) have been as 100 to 70 for rails of superior quality, and as 100 to 50 for ordinary rails. With the same monkey, but falling from a greater hight, on Bessemer rails, the following results were obtained, 100 to 50 with hard metal and half round notches, 100 to 30 same metal with square notches, and 100 to 20 with softer metal and square notches.

M. Sevene, engineer-in-chief of the Orleans Railway Company, at the request of the directors of the Creusot works, made experiments on steel rails being manufactured there. The first was a static test, pressure without shock, the points of support being 1 meter apart; the notched rail broke with a load of 30 tons, the unnotched one required 55 tons to break it. The second experiment was with a monkey, 300 kilogrammes in weight. The unnotched rails only broke when the fall reached 3·250 m. to 3·700 m.; the others, receiving the falling weight over the notch, broke with a fall of only 0·600 m. and 0·700 m. Result about 100 to 19. The notch would be of little importance were it certain that the sleepers always afford an effective support, but this is far from being the case always, and if by imperfect ramming the rail has not a perfect bearing at the reduced part, it is certain that the chance of rupture is greatly increased.

The conclusions derived from the above experiments are (1), that the reduction of the rail has less effect with regard to shocks in the case of iron than of steel rails; (2), that if, for an instant, we suppose the power of resistance of an unnotched iron rail against a shock to be only half that of a similar rail in Bessemer steel, we find that with square cut notches it will be in iron $\frac{0·70}{2}$ = 35-100ths of the solid rail, and in Bessemer metal 20-100ths, giving 15-100ths in favor of the iron rail; (3), that, therefore, the permanent way in Bessemer metal requires more careful ramming beneath the sleepers than a like permanent way in iron to prevent false bearing at the weakened part.

M. Ch. Conche is not quite right in stating that the above facts have escaped the attention of engineers. On the Lyons line fractures have always been attributed to the weakening of the rail in the manner referred to, and on the northern and eastern lines the rails are not notched; and more than that, all rails are rejected which have flaws in the shoe, as the slightest flaw will cause a rail to break at 0·50 m.

Report of Inspections, Made by the Hartford Steam Boiler Inspection and Insurance Co. for the months of October, November and December, 1874, and January, 1875.—During the four months ending February 1st, 5789 visits of inspection were made, and 11,502 boilers inspected, of which 3618 were internal and entire. The hydraulic pressure was applied in 699 cases. The defects developed by these examinations were 6160 in number, of which 1535 were regarded as rendering the boilers in unsafe condition. They were defects needing attention and they received it. These defects in detail were as follows: Furnaces out of shape, 288—64 dangerous. Fractures, 458—202 dangerous. Burned plates, 405—158 dangerous. Blistered plates, 905—179 dangerous. Deposit of sediment, 820 cases—140 dangerous. Incrustation and scale, 970—144 dangerous. External corrosion, 416—122 dangerous. Internal corrosion, 170—55 dangerous. Internal grooving, 45—30 dangerous. Water gauges defective, 238—56 dangerous. Blow out defective, 82—34 dangerous. Safety valves overloaded or out of order, 121—52 dangerous. Pressure gauges defective, 683—135 dangerous, extreme variations being from —10 to +60. Boilers without gauges, 207—4 dangerous; these 4 were run at high pressures. Cases of deficiency of water, 52—17 dangerous. Cases of broken braces and stays, 300—143 of which were so bad that the boilers were in dangerous condition. Boilers condemned as unsafe to run, 51. Among the boilers rejected were two new ones, cause, insufficient bracing. In one case a boiler nearly new was found to be in unsafe condition on account of the flanges on heads being nearly cracked through. In some instances great deficiency of staying about heads and domes has been found. As many as 3 have been found broken at one end of a boiler and two at the other. Flanges around the flues were found badly cracked. A pressure gauge was found that would not indicate at all, above 60 pounds. In another instance, a gauge was found that would not work above 60 nor below 20 pounds. A boiler in a school house (where were 300 children) was found in very dangerous condition. We might cite other instances of neglect and carelessness, but these are sufficient to show how important it is that boilers should be occasionally examined and their true condition ascertained.

Sir Goldsworthy Gurney, who lately died in England, was a man of considerable eminence as an inventor. He was the son of Mr. John Gurney, of Trevorgus, in Cornwall, and was born in 1793. He was educated for the medical profession. He gave lectures on chemical science at the Surrey Institution in London. But his career was invested with peculiar interest for engineers, by his connection with steam locomotion on common roads. In 1822 Gurney stated in a public lecture on chemical science "that elementary power was capable of being applied to propel carriages along common roads with great political advantage, and that the floating knowledge of the day placed the subject within our reach." He soon afterward constructed a little locomotive, which worked successfully with ammoniacal gas, and the results of his experiments were so satisfactory that he subsequently built a steam road carriage. In 1826 he ran this carriage several trips in the neighborhood of London, ascending Highgate Hill without difficulty. In 1827 he effected further improvements and turned out a steam carriage, with which he made a trip from London to Bath, and on one occasion he ran from Melksham to Cranford-bridge, a distance of 84 miles, in ten hours. A description of this carriage will be found in the seventh edition of "Lardner on the Steam Engine," published in 1840. In 1831 a carriage built by Gurney, for Sir Charles Dance, ran regularly between Gloucester and Cheltenham, for four months, four times a day, during which time it carried about 3000 passengers, and ran 3564 miles. Generally the distance, nine miles, was run in 55 minutes. Prohibitory turnipke rates ultimately turned this carriage off the road. Gurney invented the oxyhydrogen, or Bude light, so called from his Cornish residence, in 1825. He carried out several improvements in connection with his system of lighting, among which was an arrangement of reflectors for dispersing the light in gradually diverging rays from the lantern, and a ventilating chandelier, which was also so contrived as to evaporate small quantities of water for the purpose of keeping the atmosphere of the room in a saluary condition. The Bude light was tried for the first time in street illumination on the 10th of January, 1842, at the crossing in Pall-mall at the bottom of Waterloo Place. It is said to have illuminated the whole of the open space in which stands the Athenæum Club very powerfully, and to have caused the gas lamps to look as dim as at that time the oil lamps at the end of Gower street did to the gas lamps when established. Gurney likewise devised the well known stove which goes by his name, and a method of mine ventilation, which consisted in taking high pressure steam down the shaft and then allowing it to escape in an upward direction through a number of jets. Sir Goldsworthy Gurney died last week at his residence, in Cornwall. For the last eleven years he suffered from paralysis. In his youth he was associated with Davies, Giddy and Trevithick, and no doubt imbibed from them much of his love of mechanical science. Sir Goldsworthy Gurney was a magistrate for the counties of Devon and Cornwall.

Poisoning by Copper Fumes.—A short time ago Mr. Frank Buckland disinterred a letter received from a Welsh farmer a number of years before, which contained some curious particulars concerning the effect of the vapor from copper smelting furnaces upon cattle grazing in their neighborhood. The farmer was evidently a shrewd, observing person, one of those who see what they look upon and remember what they see. Accompanying the communication were the skull and leg bones of a cow. The former is still in Mr Buckland's possession, and is covered with osseous excrescences, similar to those seen upon the human skeleton in cases of mercurial poisoning. The grass upon which this animal was fed grew a full mile from the nearest copper works, whence emanated the vapors that deposited the cupreous poison upon it. She, however, only drew half her sustenance from that source, the other half being bran and other food brought from a distance. But for this change of diet the writer alleges she would not have lived longer than from twelve to eighteen months; with it she grazed the upas meadow three years. Cattle, we are informed, are affected by copper smoke seven miles from smelting works, this probably depending upon the direction of the prevailing winds. Copper poisoning shows itself generally, in cattle, first by the hair becoming dry and the beast dull; the eyes also water and the belly is drawn up. Hard lumps next appear on the legs and ribs, the bones of the head become enlarged, the teeth become black and waste away, and other painful symptoms supervene. But the poor animals are not allowed to die outright; before they arrive at that stage they are sold to butchers or dealers who take them out of the neighborhood and fatten them for market; but they do not take on readily. Horses are affected in the same way, but not to the same degree; and the pasture of itself fails; the finer grasses dying out until nothing is left but couch, while in the immediate neighborhood of the works the ground is perfectly sterile.

The "Emperor Bell," which has been cast at the Frankenthal foundry, near Worms, is to be transported to Cologne as soon as the river navigation is fully established after the breaking up of the ice. The metal of which this solid bell is cast weighed 50,000 pounds, and was obtained from the cannon taken in the French war, and among the 22 pieces of ordnance which have been incorporated into it there were 7 whose dates prove them to have been constructed in the time of Louis XIV. It is, therefore, not improbable that they may have been used to devastate the very same part of the old Palatinate in which the metal has been cast into its present form. The bell which is 12 feet in hight and ample enough to shelter 15 men under its dome, is adorned with a bust of St. Peter, the patron of church bells, and bears under the imperial eagle a Latin distich and a German verse, setting forth its purpose of calling together the people to attend the services of the church. The dedicatory inscription, which is graved round the margin, proclaims that "William, the high and mighty German Emperor and King of Prussia, in humble gratitude for the help granted him from above in bringing to a happy conclusion his late war with France, has caused the enemy's guns, which were taken by the German troops, to be melted down into a bell for the Cathedral Church at Cologne." In accordance with this pious intention, the inscription goes on to announce that the committee appointed to superintend the completion of the cathedral have caused the bell to be hung in the southern tower of the church, with the concurrence and during the rule of the Roman Pontiff Pius IX., and Paul Melchers, Archbishop of the See.

A California genius is the author of a new invention, intended to do away with servants around tables at meal-times. It consists of a movable railway, acting within a circle inside the plates that are to be served. It will suffice for an oblong table as well as for a round one, and is operated by the person who sits at the head, or, in other words, the one who does the carving. This individual is enabled, by means of his or her feet under the table, after the manner of working the treadle of a sewing machine, to send a plate of hash, so to speak, sailing round at lightning speed to the spot of destination, followed up with the condiments, cutlery, &c., necessary to the thorough enjoyment of the meal. The advantages of such an improvement are apparent and manifold. Beside the delays and confusion consequent upon the prevailing custom, accidents, such as spilling soup over the shoulders of those seated around the table, will be avoided.

The Coal Strike and the Iron Trade.

The following general resume of the situation in the Schuylkill, Lebanon, Lehigh and Susquehanna valleys, will show to what extent the strike of the anthracite miners has effected the iron trade:

In the Schuylkill Valley some furnaces are still supplied with anthracite by the Philadelphia and Reading Coal and Iron Company, who have managed to get some coal from the Wyoming collieries. Some furnaces are, however, running partly on coke—Seyfert, McManus & Co.'s, E. & G. Brocke's and Montgomery Iron Company's. The condition of the Schuylkill Valley furnaces is very nearly as follows: St. Clair Furnace is out; Ringgold Furnace is in; Port Carbon Furnace is in; Atkins & Brothers' three furnaces are in; Minersville Furnace is out; Topton Iron Company's furnace is out; Temple Iron Company's furnace is in; Seyfert, McManus & Co. (two stacks) have one in; Clymer Iron Company's furnace is out; Keystone Furnace Company (two stacks) have one in; Eckert & Brothers' two furnaces are out; Leesport Iron Company's furnace is out; Monocacy Furnace is out; Moselem Furnace is in; White & Ferguson's two furnaces are out; Phœnix Iron Company (three stacks), one out, and two have been "banked up" for three weeks; Montgomery Furnace is in; Norristown Furnace is out; Schall & Co.'s furnace is out; E. & G. Brooke (four stacks) have one in; Swede Furnaces are both out; D. O. & H. S. Hitner (three stacks) have two in; S. Fulton & Co.'s two furnaces are out; J. B. Moorhead & Co.'s two furnaces are out; Pottstown Iron Company's furnace is in, and Robbins & Son's furnace is in. Total number of stacks enumerated, 42; in blast, 15; and out of blast, or "banked up," 27.

Our information about the Lebanon and Susquehanna valleys is not so full, but the following embraces some of the furnaces of that locality: Hon. G. Dawson Coleman (three stacks) has one in; R. W. Coleman's Heirs & Co. (five stacks) have one in; Pennsylvania Steel Company's furnace is running partly on coke; Chestnut Hill Iron Ore Company (three stacks) have all out; St. Charles Furnaces (two stacks), and Chickes Furnaces (two stacks) are running partly on coke; Watts Furnaces are both out, but it is reported that the proprietors of Chickes Furnaces, E. Haldeman & Co., have leased one of them, intending to blow it in shortly; Cameron and Middletown Furnaces are both out; and Dauphin Furnace is in; Wistar Furnace is in, and McCormick & Co. (two stacks) have one furnace in blast, running partly on coke. Total number of stacks enumerated, 24; in blast, 10, and out of blast 14. The freight on Connellsville coke to Harrisburg is now $3·50 per ton.

In the Lehigh Valley the supply of anthracite coal is becoming so short that those iron manufacturers who are determined to use nothing else cannot expect to run their furnaces longer than the 1st of May. The Thomas Iron Company have been using coke at Alburtis and Hokendauqua for over two weeks, using about one-fourth coke to three-fourths anthracite, and they say the new fuel works satisfactorily. The Crane Iron Company have purchased 4000 tons of coke, and began to use it in one of their stacks at Catasauqua on last Saturday. They are mixing it with anthracite in the same proportion as the Thomas. Coke costs $5·50 per ton, delivered at points in the Lehigh Valley, and it has been determined by actual experiment in anthracite furnaces that 1¾ tons of coke are equal in smelting power to 1¼ tons of anthracite, these being the quantities required of each respectively to produce a ton of iron. The following is very nearly the situation in the Lehigh Valley: Carbon Iron Company (three stacks), have 1 stack in blast, and are receiving coal regularly; Lehigh Valley Iron Company (three stacks), have 2 in; Crane Iron Company (six stacks), have 3 in; Thomas Iron Company have both stacks at Alburtis in, and two out of six at Hokendauqua; Allentown Rolling Mill Company (two stacks), have 1 in; Emaus Furnace is in; Allentown Iron Company have all 5 stacks in; Lehigh Iron Company, (two stacks), have 1 in; Saucon Iron Company have both their stacks out; Bethlehem Iron Company, (four stacks), have all their furnaces in blast, but may blow all out soon; Coleraine Iron Company, (two stacks), have 1 in, but may blow it out soon, as they are out of coal; Peter Uhler's furnace is out; Glendon Iron Company (five stacks), have 2 in; Millerstown Iron Company's furnace is out; North Penn Iron Company's furnace is in, but is expected soon to blow out; and Edge Hill Iron Company's furnace is in. In New Jersey the Andover Iron Company (three stacks), have 2 in; Musconetcong Iron Company (two stacks), have 1 in; and Port Oram Iron Company's furnace is in. Total number of stacks enumerated, 53; in blast, 31; and out of blast, 22.

The grand total of the above mentioned furnaces is 119; in blast, 56, and out of blast, 63.

Cost of Water in Brooklyn.

During the past winter Brooklyn has been drawing so heavily upon her reservoirs that the water commissioners were seriously alarmed for the supply. So rapidly did the consumption increase during the extreme cold weather that the water level of the reservoirs was lowered much below the proper limit. And it is probably owing to this fact, and the velocity of flow through the pipes, that the water has been so turbid for a considerable portion of the time during the winter. During the few days in which the consumption reached its maximum, the pumps were unable to supply the water as fast as it was used, hence the lowering of the water in the reservoirs. Had it not been for the appeal of the commissioners to the people, through the columns of the daily papers, it is probable that the city would in a few days have experienced a water famine of the severest character. The consumption at this time was not a legitimate one, people fearing frost left valves, faucets, cocks, in fact, every opening in connection with the mains, wide open. The result was a waste that was really alarming. A circulation is all that is needed, and a small stream constantly running will keep this up, and as effectually prevent freezing as a faucet left wide open. The following figures will give our readers some idea of the cost of the water, and how important it is that all unnecessary waste be prevented.

The cost of the works, under the original contract, was $4,625,000, and the expense of extending and perfecting them during the subsequent years has more than equaled this amount. The total cost at present is $9,500,000, and their value, or the cost of constructing them, at the existing rates for land, labor and material, has been estimated at $15,000,000. The rates have been so adjusted as to cover, as nearly as possible, the necessary expenses of interest, deposit and maintenance, and the surplus, if any, is, by recent legislation, made a part of a special sinking fund. The water revenue is collected in two forms—as regular and as extra rates. The regular rates are calculated upon the front dimensions of the building before which the distributing pipe passes, or, in the case of vacant property, upon the frontage and assessed valuation. Each building is entitled to the use of one bath, one water closet, and the necessary sinks and basins for the domestic uses of twelve occupants, without charge further than the payment of the regular rates; all water fixtures and occupants in excess of these are subject to additional charge. The regular rates accrue whether the water is introduced into the premises or not, and become a lien upon the property in the same manner as the city taxes. The extra rates are collected for the use of water for other than domestic purposes, and their payment is enforced by the cutting off of the supply. The rates are established upon the basis of a charge of 3 cents per 100 gallons of water used for domestic purposes, 2½ cents for a like amount of building, stabling, fountain and tavern uses, and 2 cents per 100 gallons for business and manufacturing purposes, steam engines, etc. For the latter uses, the quantity taken is accurately determined by meters; but in the other cases, as there are no means of limiting the quantity consumed by each, the rate is far from being uniform or equitable. During the year 1872 the cost of pumping alone was one-eighth of one cent per 100 gallons, and the total cost of delivering 8,250,000,000 gallons was at, very nearly, the rate of 1 cent per 100 gallons. Not far from 35,000,000 gallons were used for fire and sewer purposes, and about 3,000,000,000 gallons were paid for at the rates above, leaving over 5,000,000 gallons furnished gratuitously. It is evident that an enormous waste of water is allowed by many negligent members of the community; in fact, the average consumer, who pays but $10 a year for the use of water, may, by leaving his faucet open, waste in one year $300 worth of water, at the established rates, or water that it has cost over $20 to pump into the reservoir. A general system of supply by measurement through meters would, no doubt, curb the extravagant waste, but might, on the other hand, induce an economy of water that would be prejudicial to the public health and cleanliness, and interfere with the proper discharge of the more solid portions of the sewage. A reduction in the size of the taps, or the use of meters designed to discontinue the flow when the amount of water paid for by the rate fixed upon the premises shall have been drawn, would seem a medium course, and one promising favorable results.

Gas Explosions.

The following article we extract from a recent issue of the *Sanitary Record* for the consideration of our readers:

Gas explosions have never been so frequent as during the past few weeks, and it is high time that the causes of these accidents were thoroughly inquired into. If, as a late writer on sanitary matters explains, we employ a gas-fitter who is not a gas-fitter, but a Jack-of-all-trades, a "blacksmith, white-smith, glazier, brazier, plumber and bell-hanger," all rolled into one, we may safely look out for nuisances arising from our gas pipes—in the positive degree, waste of money; in the comparative degree, bad smells; and, in the superlative degree, suffering and death.

The same writer explains how careless we in England seem to be about our gas supplies, the companies caring not one farthing what desperately bad work may be done inside the house, and the householder apparently caring as little, content if his fitter informs him that all is now connected to the meter, and that he may light up. Strange it is, and disgraceful too, that perhaps not half a dozen gas fitters in London even proceed systematically to test the pipes for leakages before finally leaving the work. Very few go to the trouble of fixing a temporary burner on each floor, and then, igniting these jets, allow them to burn for a short time and try and discover by sense of smell any faults of the pipes laid on the way to these trial jets. Fewer still take the trouble to turn out the gas, take at the same time the reading of the meter, and note whether, after the lapse of a few hours, the finger on the dial still indicates a consumption of gas, in which case it is simply being disseminated over the house.

The proper manner in which to test house pipes—we do not speak of testing the pipes themselves before they are laid, for that the pipe makers mainly do, but to test them after every ramification of iron barrel and composition tube has been duly fitted up—is to adopt a plan which we understand is largely practiced in America, and as it is as simple as possible, it ought, we think, to speedily become naturalized among us. We will suppose a mansion to be fitted up by a gas fitter for the proprietor, every pipe in place, and all ready for screwing up the brackets or pendants. This being so, the gas fitter stops up all the outlets with screwed caps or other contrivances, all but one, and to this he affixes a force pump, with a few drops of sulphuric ether dropped into its interior. The pump is now connected with a gauge, and set to work up to some moderately high pressure—sufficient, at all events, to find out any weaknesses, such as small holes or opening seams owing to imperfect welding. When the gauge registers a certain figure the pumping is stopped, and if the pressure lesseus it is evident that the pipes are somewhere unsound, and these imperfections are sought for. If they cannot be found by the smell of the escaping ether, the pipes are lathered over with soap, and the leaks detected by the bubbles. This experiment is repeated until the gauge ceases to show a loss of pressure, and then only need the fitter trouble the gas company about an attachment to their mains. The official of the company—for he is an official in every sense of the word—looks at the dial, which now indicates no loss of pressure, and hands over his authorization to connect. This is an amount of precaution that in our country we very rarely attempt; indeed, we question if twenty journeymen gas fitters out of one hundred ever heard of it.

American vs. English Railway Practice.

A correspondent of the London *Times*, commenting on the recent fatal railway accident at Shipton, takes occasion to show why it is that such an accident could not have occurred on an American road. He says, very truly:

"1. If the solid cast wheel of America had been used, instead of the compound steel tired English wheel, the break could not, probably, have occurred.

"2. The break having occurred, if there had been cord and bell communication, as in America, the occupants of the fated carriage could have communicated with the engine driver and had the train stopped.

"3. If they had had air brakes, as in America, the engine driver might still have stopped the train after he became aware of the trouble, before the fatal leap.

"4. If they had used the American coupling, instead of the heavy English chain fastenings, the accident might, at most, have been limited to one carriage."

The writer says:

"We are not, unfortunately, exempt from railway accidents in America. The number is greater, perhaps, than here, but they occur from other causes, well understood. For example, many roads have but single tracks, giving greater liability to collision. They often pass through forests, where trees are blown on the tracks by storms; the heavier rains and freshets of that country more often disturb bridges, culverts, &c. As the tracks are not inclosed, live stock, running at large, often obstruct the way. Being a rougher country, there are more cuts and 'fills,' and consequent danger of land slips, falling rocks, yielding trestles, &c. These, and such like causes, must excuse to some extent the frequency of American railway accidents; but the superiority of their rolling stock, appliances and management doubtless prevents and avoids many such fatal disasters as that which has just occurred at Shipton, and which, probably, would not have occurred if American appliances had been used."

A Reading (Pa.) exchange says: The charcoal furnaces throughout the State have been reduced in numbers for the past years and changed to anthracite. The following are still in the counties named: Cumberland, 5; Huntingdon, 4; Berks, 5; Adams, 2; Franklin, 4; Lawrence, 2; Lebanon, 1; Centre, 4; Mifflin, 1, Blair, 3; Carbon, 1; Bedford, 1; Chester, 1, Perry, 1; Schuylkill, 1; Clarion, 1; Dauphin, 1; Lancaster, 1; Fayette, 1; Clinton, 1; York, 1. Total 42.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, April 7, 1875.

The past week has been characterized chiefly by a relapse of the several financial markets into the condition which prevailed before the sudden development of speculation actively noted last week. The backwardness of the spring season has had an unfavorable effect upon general trade, and "settled weather" is earnestly desired by the business community. The money market has been unsettled, but, in the main, easy. Rates to borrowers on call have been 3 @ 5 per cent., with a few instances reported of a spasmodic advance to 7 per cent. There has been a good demand for mercantile paper a 5 @ 7 per cent., according to date of maturity.

The stock market has been strong and prices of speculative shares well maintained. The volume of business was less than last week, and the principal dealings were in Union Pacific, which has led the upward movement, Western Union, Pacific Mail, Erie, Wabash and Northwestern.

Government bonds have declined here in sympathy with gold. In London they remain strong, but quiet. Investment shares generally are quite firm.

The following is a comparison of the bank averages for the past two weeks. By the loss in legal tender notes, which is explained by the April currency movement, the banks lose in total reserve $680,000, and in surplus reserve $717,900. The gain in specie is not fully or nearly shown by the statement which is made up on averages. The banks probably have for the same reason fewer legal tenders than they show; but altogether there is no doubt they are much stronger than they appear to be:

	March 27.	April 3.	Differences.
Loans	$279,052,800	$279,554,600	Inc. $501,800
Specie	8,282,800	9,665,500	Inc. 1,382,700
Leg. Ten	51,899,500	48,836,800	Dec. 2,062,700
Deposits	214,724,500	214,876,100	Inc. 151,600
Circulation	21,534,800	21,438,500	Dec. 96,300

The gold market has recovered from the excitement of last week, and the premium on coin loans has ranged 114 @ 115. The chque have completely unloaded, and the banks now hold the coin, although the table of comparative averages given below does not show the gain, as it was not returned until late in the week, and too late to raise the week's average in proportion to the amount actually returned. The following table shows the extreme daily range of the premium:

	Highest.	Lowest.
Thursday	114⅜	114⅛
Friday	114⅛	114
Saturday	114⅛	114
Monday	114⅜	114⅛
Tuesday	114⅜	114⅛
Wednesday	114⅜	114⅛

The following tables show the foreign trade movements for the week:

IMPORTS.

	1873.	1874.	1875.
Total for week	$7,576,073	$9,851,827	$8,866,275
Prev. reported	113,332,540	100,544,587	88,131,706
Since Jan. 1	$120,908,613	$110,396,414	$96,997,981

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Antimony ore	6	$495
Anvils	1,143	11,908
Brass goods	195	30,681
Bismuth	4	1,741
Bronzes	91	21,975
Chains and anchors	1,497	65,315
Copper		7,194
Cutlery	1,387	487,246
Gas fixtures	3	2,810
Guns	938	111,218
Hardware	1,165	121,506
Iron, hoop	5	373
Iron, ore	497	1,542
Iron, pig, tons	5,954	158,840
Iron, sheet	95	11,519
Iron, other, tons	2,878	159,443
Iron tubes	524	1,899
Iron cotton ties	7,741	25,129
Lead, pigs	30,927	199,419
Metal goods	2,833	255,460
Nails	194	9,773
Needles	181	93,212
Old metal		22,336
Plated ware	8	1,217
Platina	10	29,559
Per caps	149	28,963
Saddlery	56	11,084
Steel	27,640	333,916
Spelter, lbs	142,253	7,995
Silverware	34	3,282
Tin plates, boxes	319,327	2,480,489
Tin, slabs, lbs	1,905,734	431,855
Wire	3,528	74,831
Zinc, lbs	2,005,859	121,606

EXPORTS OF SPECIE.

Total for the week	$535,935
Previously reported	15,686,346
Total since January 1, 1875	$16,222,281
Same time in 1874	8,448,966
Same time in 1873	14,766,584
Same time in 1872	5,222,531

Government bonds at the close were strong. The quotations were as follows:

	Bid.	Asked.
U. S. Currency 6's	119½	120
U. S. 6s 1881, reg	120½	121
U. S. 6s, 1881, cou	121½	122
U. S. 1862, 5-20 reg	115½	—
U. S. 5-20 1862, cou	117⅝	118
U. S. 5-20 1864, reg	115⅛	116
U. S. 5-20 1864, cou	119	119¼
U. S. 5-20 1865, reg	116½	117
U. S. 5-20 1865, cou	121	121⅛
U. S. 5-20 1865, reg. new	120⅛	120⅝
U. S. 5-20 1865, cou	120⅝	120⅝
U. S. 5-20 1867, reg	120⅝	121
U. S. 5-20 1867, cou	121	121⅛
U. S. 5-20 1868, reg	120¾	121⅛
U. S. 5-20 1868, cou	121	121⅛
U. S. 10-40 reg	114⅛	114⅝
U. S. 10-40 cou	115¼	115⅜
U. S. 5s, 1881, reg	115	115¼
U. S. 5s, 1881, cou	115½	115⅝

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	101⅝	101⅛
Lake Shore	73⅞	73¾
Rock Island	102¾	102⅝
New Jersey Central	111	111
Delaware, Lackawanna & Western	113	112½
Michigan Central	75	75
Wabash	16⅛	15¼
Western Union Telegraph	78⅛	77¾
Atlantic and Pacific Telegraph	27¼	24½
Northwestern	45⅝	44⅞
" Pref	58⅝	58½
Milwaukee & St. Paul	39½	36⅞
" " Preferred	58½	58½
Panama	121	121
Pacific Mail	43⅛	41⅜
Erie	30¾	28⅝
Ohio & Mississippi	28⅝	28½
Union Pacific	71	70⅝
C., C. & Ind. Cen	6¼	6⅜
Missouri Pacific	47⅝	47¼
Hannibal and St. Joseph	27½	27⅜
Consolidated Coal	47½	47½

GENERAL HARDWARE.

There is a fair amount of business doing, and we hear few complaints of dullness. There are some buyers in the city, but these are chiefly of the smaller class, and the bulk of the trade continues to be transacted by letter. The changes of importance which have occurred during the week will be found below.

The condition of the Nail Market differs but little from our last report. The demand continues fair, and prices are firm at $3·25 for 10d in lots of 200 kegs and over. Small lots bring $3·35 @ $3·40.

The demand for Foreign Hardware is generally reported fair, and the sum total of trade in this branch for the month of March is more satisfactory than was anticipated. The change in the price of Flat Head Iron Wood Screws, announced last week, acts seriously on the foreign article, and importation will, without doubt, be checked, unless the English makers reduce their present scale of prices. Hermann Boker & Co., agents for Nettlefold & Chamberlain's Screws, have in stock a fair assortment, which they quote at discount 60 and 10 per cent. Alfred Field & Co. have in stock and afloat a full assortment of the Birmingham Screw Co's goods, which they offer at the same discount, and in both of these cases an extra discount for quantity would be allowed. George W. Bruce has issued the following circular on this subject:

1 PLATT STREET, NEW YORK, April 1, 1875.

You are respectfully informed my prices for Flat Head Iron Screws are reduced, and the following are my present cash discounts from the new American lists:

English Iron Flat Head	62½&5 %
" " " Blued	57½&5 %
" " " Tinned and Galvanized	40 %
" Round " Bright	50&5 %
" " " Blued	50 %
Brass Flat "	50&10 %
" Round "	50 %
Machine Flat Head	30&12½ %
" Round Head	25&12½ %
The Atlantic and International American Screws	62½&2½ %
Stove Bolts	20 %

Prices subject to changes of the market without notice. Terms, cash within 30 days, in funds at par in New York. The above are for usual assortments, but for extraordinary, special rates will be fixed. Having a stock of English Screws in bond, I am prepared to offer a great advantage to exporters.

GEORGE W. BRUCE.

Van Wart & McCoy, Nos. 134 and 136 Duane street, have received from Van Wart, Son & Co., Birmingham, a new and complete line of samples of Hardware, including Cutlery, Saddlery, and other English goods, to which they invite the attention of buyers, with a view of giving orders for importation.

Russell & Erwin Mfg. Co., Mallory, Wheeler & Co. and William Wilcox & Co. advanced their prices for Padlocks on the 1st instant, the new terms being concisely stated in the following circular:

CIRCULAR.

Until further notice, our discount on Padlocks and Padlock Keys will be 45 per cent., instead of 50 per cent., as heretofore.

WILLIAM WILCOX & Co.

Middletown, April 1st, 1875.

The list on small Brass Padlocks has been reduced to the following prices:

⅝ inch	per doz.,	$2·50
1 "	"	2·50
1¼ "	"	3·25
1½ "	"	3·50
⅝ " Plated	"	4·25

Russell & Erwin Mfg. Co. are introducing a new line of Steel Key Mortise Locks, numbered 0301, 0302, 0303, 0304, at the same prices as their old Brass Key Locks numbered 301, 302, 303 and 304. These Locks are made with their well known pull-out reverse.

Sargent & Co. issue the following circular, which embodies the changes made by Mallory, Wheeler & Co. in these and other goods since the beginning of the year:

Attach to Mallory, Wheeler & Co.'s list in our book. Cancel all their circulars prior to this date.

CIRCULAR.

Until further notice our discount on Mallory, Wheeler & Co.'s Padlocks and Padlock Keys will be 40 per cent., and 10 per cent. extra discount for prompt cash. Discount on Door Locks, Knobs, &c., unchanged.

Change their price list of the following goods:

SMALL PADLOCKS.

Brass.

No.	Per doz.	No.	Per doz.
38, Make	$2·75	42, Make	$2·50
39, "	3·25	43, "	3·00
40, "	2·50	44, "	3·25
41, "	2·50	45, "	3·50

Nickel Plated.

No.	Per doz.	No.	Per doz.
48. Make	$5·50	53. Make	$5 25
49, "	6·00	54, "	5·75
51, "	5·25	55, "	6·25
52, "	5·25	56, "	6·50

Bronze Metal Door Knobs.

No.	Per Pair.	No.	Per Pair.
1121, Make	$3·00	1157, Make	$3·75
1123, "	3·00	1159, "	3·75
1125, "	3·00	1161, "	3·75
1127, "	3·00	1163, "	3·75
1129, "	3·00	1165, "	3·75
1131, "	3·00	1167, "	3·25
1133, "	3·00	1169, "	3·25
1135, "	3·00	1171, "	3·25
1137, "	2·75	1173, "	3·25
1139, "	2·75	1175, "	3·25
1141, "	2·75	1177, "	3·25
1143, "	2·75	1179, "	3·25
1145, "	2·75	1181, "	3·75
1147, "	2·75	1183, "	3·25
1149, "	2·75	1185, "	2·75
1151, "	2·75	1187, "	2·25
1153, "	3·75	1189, "	3·25
1155, "	3·75	1189½, "	2·75

Add to their Price List the following new Locks.

Improved Builders' Upright Rim Knob Locks.

Reverse by Pulling Latch Bolt forward and turning half round.—With Thin Bit Key.

No.	Per doz.
825, 4½x3½ in., Iron Bolts, Nickel Key, 2 Rack Tumblers	$11·25
826, 4½x3½ in, Iron Bolts, Nickel Key, 3 Rack Tumblers	14·25
827, 4½x3½ in., Iron Bolts and Thumb Bolt, Nickel Key, 2 Rack Tumbler	12·75
828, 4½x3½ in., Iron Bolts, and Thumb Bolt, Nickel Key, 3 Rack Tumblers	15·75
829, 4½x3½ in., Brass Bolts, Nickel Key, 2 Rack Tumblers	18·25
830 4½x3½ in., Brass Bolts, Nickel Key, 3 Rack Tumblers	16·25
831, 4½x3½ in., Brass Bolts and Thumb Bolt, Nickel Key 2 Rack Tumblers	16·25
832, 4½x3½ in., Brass Bolts and Thumb Bolt, Nickel Key, 3 Rack Tumblers	19·25

Builders' Horizontal Rim Closet or Dead Locks.

For right or left hand doors, with thin bit key.

No.	Per doz.
842, 3¼x2½ in., Iron Bolt, 1 Rack Tumbler, Nickel Key, 24 changes	$ 7·50
843, 3¼x2½ in., Iron Bolt, 2 Rack Tumblers, Nickel Key, 36 changes	10·50
844, 3¼x2½ in., Iron Bolt, 3 Rack Tumblers, Nickel Key, 75 changes	13·50
845, 3¼x2½ in., Brass Bolt, 1 Rack Tumbler, Nickel Key, 24 changes	9·50
846, 3¼x2½ in., Brass Bolt, 2 Rack Tumblers, Nickel Key, 36 changes	12·50
847, 3¼x2½ in., Brass Bolt, 3 Rack Tumblers, Nickel Key, 75 changes	15·50

New York, April 1st, 1875.

The following changes have also occurred, and new goods added to Mallory, Wheeler & Co.'s list since 1st January, 1875:

Mineral and Pearl White Door Knobs.

Advanced as follows:

No.	Per doz.	No.	Per doz.
216	$2·25	440	$7 50
218	2·25	442	7·00
236	3·00	444	7·50
238	3·00	446	7·50

New York, February 2d, 1875.

Add to their price list of January, 1875, as follows:

Mortise Locks.

To reverse by pulling Latch Bolt forward and turning half round.

No.	Per doz.
994, 3½x3 in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Tinned Malleable Iron Key	6·50
995, 3½x3 in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Nickel Key, 24 changes	8·00
993, 4x3¼ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Tinned Malleable Iron Key	7·50
999, 4x3¼ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Nickel Key, 24 changes	9·00

The following to reverse by removing Cap.

960, 3½x3 in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Tinned Malleable Iron Key	6·00
970, 3½x3 in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Nickel Key	7·50
964, 4x3¼ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Tinned Malleable Iron Key	7·00
974, 4x3¼ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Nickel Bey	8·50
979, 4½x3½ in. Lacquered Iron Front, Brass Bolts, Wrought Iron Striking Plate, 1 Tumbler, Thin Bit Nickel Key	12·25
980, 4½x3½ in., Brass Front and Striking Plates, Iron Bolts, 1 Tumbler, Thin Bit Nickel Key	13·75
981, 4½x3½ in., Brass Front, Bolts, Hub and Striking Plate, 1 Tumbler, Thin Bit Nickel Key	16·00

⅜ in. Thick, for Thin Doors.

989, 4½x3½ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Brass Key	9·25
991, 4½x3½ in., Lacquered Iron Front, Iron Bolts, Wrought Iron Striking Plate, 1 Tumbler, Tinned Malleable Iron Key	8·00

Any other Mortise or Rim Knob Locks on their list styled Builders' or Sparks' furnished to reverse by removing cap, at 50 cents less than Locks that reverse by simply pulling the Lath Bolt forward and turning half round, leaving the interior mechanism undisturbed.

Reduce the list price of the following:

Upright Rim Knob Locks, with Thin Bit Key.

No.	Per doz.	No.	Per doz.
1025 to	$ 8·25	1027 to	$ 9·75
1026 to	10·25	1028 to	13·25

Horizontal Rim Knob Locks, with Thin Bit Key.

No.	Per doz.	No.	Per doz.
1029 to	$12·00	1031 to	$14·00
1030 to	14·00	1032 to	16·00

New York, February 15th, 1875.

Make the following changes in their Price List o January, 1875:

Mortise Knob Locks.

No.	Per doz.	No.	Per doz.
179	$7 50	579	$6·50
183	9·00	583	8 00

Upright Rim Knob Locks.

No.	Per doz.	No.	Per doz.
1	$6·25	217½	$13 00
1½	7·75	223	10·50
211	6·50	228	9·00
213	8·00	600	15·50
215	8·00	602	13·50
215½	10·00	1025	8·25
217	9·50		

Horizontal Rim Knob Locks.

No.	Per doz.	No.	Per doz.
239	$10·00	249	$14·00
241	12·00	1031	14·00
247	12·00		

Add to their Price List the following New Locks:

Upright Rim Knob Locks.

To Reverse by removing Cap.

No.	Per doz.
001, Same style as No. 01	$6·00
001½, " " 01½	7·50
0211½, " " 0211	6 25
213½, " " 213	7·50
0215½, " " 0215	7·50
215¾, " " 215½	9·50
217¼, " " 217	9·00
217¾, " " 217½	12·50

Horizontal Rim Knob Locks.

To Reverse by removing Cap.

No.	Per doz.
0239¾, Same style as No. 0239½	$7·00
0243, " " 0239½, with Thumb Bolt	7·25
0243¾, Same style as No. 0243½	8·25
0247¾, " " 0247½	8·50
0251, " " 0247½, with Thumb Bolt	8·75
0251¾, Same style as No. 0251½	9·75

Sparks' Horizontal Rim Knob Locks.

To Reverse by pulling Latch Bolt forward and turning half round.

No.	Per doz.
0243½, 4½ x 3½ in., Iron Bolts and Thumb Bolt, Tinned Malleable Iron Key	$8·75
0251½, 4½ x 3½ in., Iron Bolts and Thumb Bolt, Brass Key	10·25

Their Locks Nos. 0239¾ and 0247¾ are now made with a Lever Stop to Latch, at the same prices, $5·75 and $7·25.

NEW YORK, March 10, 1875.

The Massachusetts Screw Co., J. Clark Wilson & Co., agents, have issued their revised list, conforming to the figures published in our last issue. They quote these goods discount 62½ per cent. J. C. W. & Co. quote "H. Clark's" Brad Awls and Tools No. 2 (20 Tools), list $12·50, discount 40 per cent., instead of 30 and 10 per cent., as formerly.

H. Hammond & Co., Hartford, Conn., quote their Solid Cast Steel Hammers at the following list, which is subject to discount 5 @ 10 per cent., according to quantity:

Adze-Eye Hammers.

	Price Per dozen.	Weight per Single Hammer.
No. 1	$11·25	1 lb. 4 oz.
No. 1½	10 00	1 lb. 0 oz.
No. 2	8·50	13 oz.
No. 3	6·50	7½ oz.

Adze-Eye Bell-Face Hammers.

	Price Per dozen.	Weight per Single hammer.
No. 1	$12 00	1 lb. 3 oz.
No. 1½	11·00	1 lb. 0 oz.
No. 2	9·50	12 oz.
No. 3	7·25	7 oz.

The manufacturers of Iron Wire have advanced the price of Bright and Annealed to discount 50 @ 55 per cent. for Nos. 19 to 26, and discount 55 @ 60 per cent. for Nos. 27 to 36.

Nos. 0 to 18 Bright and Annealed Market, Grape and Fence Wire is still quoted at discount 45 @ 50 per cent., but we are informed that an advance is contemplated at an early day. Fairbanks & Co., No. 311 Broadway, have issued the following net list for "The Miles Alarm Money Drawer:"

	Per dozen.	Per half dozen.
No. 3 Single Lock Money Drawers	$22·00	12·00
No. 1 Double " "	36·00	19·00

G. N. Stearns & Co., Syracuse, N. Y., have issued the following lists and discounts for the goods of their manufacture:

Hollow Augers.

	Per doz.	Dis. %
No. 1, Adjustable	$48·00	25
No. 2, Expansion	48·00	25
Bonneys's Adjustable	48·00	25
Patent Expansion Fore Auger	30·00	25
Stearns' Spoke Pointers	10·00	20

Bit Brace.

	6	8	10	12		
Backus Patent, per doz.	21,	24,	27,	30..	33·00	40
" " Angular Borer					24·00	

Bodymakers' Corner Clamps.

No. 1, 5 inch	9·00	25
No. 2, 7 "	12·00	25
No. 3, 9 "	15·00	25

Breast Drills.

No. 1	40·00	25
No. 2	48·00	25

Bench Hooks.

Skinner's Patent	8·00	30

Countersinks.

Wheeler's Patent, plain	4·00	20
" with gauge	5·00	20

Clothes Line Holders.

Eureka, per gross	15·00	20

Nippers.

Hall's Patent Compound Lever, No. 1	15·00	25
" " " " No. 2	21·00	25
Eureka Bevel Edge, No. 1, 5 inch	12·00	25
" Straight Face, No. 1, 5 inch	12·00	25

Saw Vises—Stearns' Patent.

No. 1	24·00	30
No. 2	36·00	30

Saw Sets.

Aikens' Hammer, common	4 00	20
" " Cast Steel	4·25	20
" " with attachment to screw on a bench	8·75	20

Spoke Shaves.

Stearns Iron	6·00	25
" New Circle	7·00	25

Tongs.

Pat. Steel, Swivel Jaw, No. 1, per pair	1·50	15
" " " " " 2, "	1·50	15

PADLOCKS.

Security Scandinavian.

No. 9, Red	No. 9¾, Black	10·50	15
No. 10, "	No. 10¾, "	12·00	15
No. 11, "	No. 11¾, "	15·00	15
No. 12, "	No. 12¾, "	18·00	20
No. 13, "	No. 13¾, "	22·00	20

Iron Padlocks.

No. 00000, American	1·15	45
No. 0000, "	1·15	45
No. 600, Red and Black	6·00	20
No. 601, "	8·00	20
No. 602, Black	8·00	20
No. 603, "	9·50	20

Brass Padlocks.

No. 620, Silver Plated	15·00	25
No. 625, Fine Brass	14·00	25
No. 626, "	15·00	25
No. 630, "	8·00	25
No. 631, "	12·00	25

The New England Butt Co., Providence, R. I., have issued the following revised list and discounts under date of 27th ultimo:

FAST JOINT BUTTS.

Narrow.

Inch.		Inch.	
1	$0·45	3¼	$1·00
1¼	·48	3½	1·20
1½	·50	3¾	1·30
1¾	·55	4	1·40
2	·60	4½	1·90
2¼	·65	5	2·30
2½	·70	5½	2·90
2¾	·80	6	3·50
3	·95		

Broad.

Inches.		Inches.	
2 x2	$0·83	4 x4½	$3·22
2 x2½	1·00	4½x4	3·22
2½x2	1·00	4½x4½	3·77
2½x2½	1·12	4½x5	4·00
2½x3	1·40	5 x4½	4·00
3 x2½	1·40	5 x5	5·35
3 x3	1·56	5 x5½	5·75
3 x3½	1·90	5½x5	5·75
3½x3	1·90	5½x5½	6·25
3½x3½	2·12	4 x6	6·00
3½x4	2·25	4½x6	6·25
4 x3½	2·25	6 x5½	6·50
4 x4	2·70	6 x6	8·00

LOOSE JOINT BUTTS.

Narrow.

Inch.		Inch.	
2	$0·92	3	$1·47
2¼	1·05	3½	1·62
2½	1·12	4	2·12
2¾	1·22	4½	2·80

Broad.

Inches.		Inches.	
2 x2	$1·05	4½x4	$3·45
2½x2½	1·14	4½x4½	4·00
2 x ½	1·24	4½x5	4·25
2½x2	1·22	6 x4½	4·25
2½x2½	1·34	4 x6	5·50
2½x3	1·60	4½x6	6·00
3 x2½	1·60	5 x5	5·56
3 x3	1·78	5 x5½	6·00
3 x3½	2·12	5½x5	6·00
3½x3	2·12	5½x5½	6·50
3½x3½	2·34	5½x6	6·75
3½x4	2·48	6 x5½	6·75
4 x3½	2·48	6 x6	7·00
4 x4	2·90	6 x6½	7·50
4 x4½	3·45	6 x7	9·00

PARLIAMENT OR CONGRESS BUTTS.

Loose Joints.

Inches. When Open.		Inches. When Open.	
2½	$0·92	6	2·33
2¾	0·92	6½	2·62
3	1·12	7	2·90
3½	1·24	8	3·50
3½	1·42	9	4·50
3¾	1·58	10	6·00
4	1·90	10½	6·75
4½	1·95	11	7·50
5	2·00	11½	8·25
5½	2·10	12	9·00

MAYER'S HINGES.

Loose Joints.

No. 0 when open 2 x3½	$1·23
No. 1 " " 2½x3½	1·33
No. 2 " " 2½x3¾	1·67
No. 3 " " 2½x4	1·90
No. 4 " " 3 x4½	2·56
No. 5 " " 3½x4½	2·67

Discounts.

Wire Narrow Fast Joint Butts		25&10 %
" Broad "	"	35&10 %
Common Narrow "	"	30&10 %
" Broad "	"	40&10 %
Narrow and Broad Loose Joint Butts		50&10 %
Parliament Butts and Mayer's Hinges		40&10 %

Terms—Net cash within 30 days from date of invoice.

If time is taken, interest will be charged at the rate of 7 per cent. per annum, and all bills not remitted for within 30 days from their date, will be subject to a draft at sight, without notice.

Payments to be made in funds at par in New York, Boston, Philadelphia, Baltimore or Providence.

Packages will be charged for at reasonable prices. Goods will be delivered on wharf, by the ordinary freight conveyances, at New York, Philadelphia and Baltimore: and in Boston at the depot of the Boston and Providence Railroad Company.

No allowance for cartage or wharfage in the above named places.

The American Butt Co., Providence, R. I., publish the following discounts from the new list. They say:

In pursuance of an agreement with other Cast Butt manufacturers, our discounts will be as follows from list of Cast Butt Hinges adopted March 26th, 1875.

	Dis. from List Prices.
Narrow Fast Joint Butts	30&10 %
Broad " "	40&10 %
Common Loose Joint Butts	50&10 %
Mayer " "	40&10 %
Parliament " "	40&10 %
Reversible Loose Pin Acorn Tipped Butts, Paneled	45&10 %
Reversible Loose Pin Acorn Tipped Butts Paneled and Japanned	45&10 %
Reversible Loose Pin Acorn Tipped Butts, Paneled and Japanned, with Nickeled Acorns	45&10 %

Orders received subject to rates ruling when filled.

We invite the attention of the trade to "Secor's Excelsior Weeder," a new floral tool manufactured by McLeod & Reordon, Troy, N. Y., and illustrated in their advertisement on page 19. This Weeding Fork is patented; it has five tines sufficiently long to reach the roots of the most obstinate weeds, and its form of construction is such that the operator draw it toward him (instead of prying up as with the ordinary Weeding Fork), is enabled to use all the power that is necessary to remove weeds and roots, however firmly held in the ground. It is also useful for loosening the soil round plants and shrubs, and will perform this work more thoroughly than can be done with any implement that has up to the present been brought to our notice. These goods are well and strongly made. They are offered to the trade at $2 per dozen, net. In lots of one gross and over a discount from this price will be allowed.

There is a perceptible improvement in the demand for House Furnishing Goods, Tinners' Stock, &c., and already the inquiry for Water Coolers and other goods for summer trade has commenced. Joseph Schieder & Co., No. 58 Beekman street, have in stock a handsome assortment of Water Coolers which they quote at the following list, less discount 10 per cent.:

Water Coolers.

Gallons	2	3	4	6	10
Each	$2·00	2·50	3·00	3·75	6·50

Plated Faucets.

Each	$2·50	3·00	3·75	4·50	7·50

Bramhall, Deane & Co. have removed their salesroom and office from 295 Water street to the large and handsome store, No. 724 Broadway, where they exhibit a large assortment of Kitchen Ranges, Hot Air Furnaces, Steam Heating Apparatus and Hyde's Patent Coffee Roasters, &c. Their large rotary Coffee Roaster is admirably adapted to the purpose of blueing screws, tack, bolts and kindred goods, and we are informed that some makers of these goods have them in use for this purpose, and are much pleased with their operation.

Charles Parker has fitted up the store No. 97 Chambers and 79 Reade streets, and will remove his stock from the old stand, No. 83 Duane street, in a day or two.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*

WEDNESDAY, April 7, 1875.

Scotch Pig.—During the week the market has been depressed, and prices are now lower than when last quoted; but it is believed that there is no legitimate reason for the drop, and an early recovery is highly probable. The following are makers' quotations:

Gartsherrie No. 1	80/
Coltness No. 1	82/
Glengarnock No. 1	78/
Eglinton No. 1	71/

Manufactured Iron and **Rails** continue without change.

IRON.

American Pig.—The state of the market is exceedingly unsatisfactory to producers. The troubles in the coal districts have again assumed a very threatening aspect, and at present Iron is produced at a cost largely above what it was at the beginning of the year, but neither the increased present cost, nor the danger of future stoppage altogether, has had the least effect in either stimulating inquiry or advancing prices. There is extremely little demand, and for this reason the small quantity at present on the market is sufficient to meet all inquiries. We quote No. 1 Foundry, $28; No. 2 Foundry, $26, and Gray Forge, $24 @ $26, at which prices lots of 100 tons have been sold. We hear of no larger transactions.

Scotch Pig.—Larger quantities are now coming in, and some of them have been forced on the market at less than the cost of importation for prompt cash. The tendency of the market has been downward, and prices are irregular. We note the sale of 100 tons Coltness from ship at $36; 100 tons at $35·50; and 200 tons on private terms. We quote: Coltness, $36 @ $38; Glengarnock, $36·50 @ $37; and Eglinton, $33 @ $34.

Rails.—In Rails we hear of considerable inquiry, but no transactions, and we continue our quotations of $48 @ $53 for American at mill.

Old Rails.—The only sale we hear of is 150 tons, time and interest.

Scrap.—The stock is very small, and firmly held by a few parties. We hear of the sale of 400 tons on private terms. We continue our quotation of $35 @ $37.

The following is BIGELOW & JOHNSTON'S monthly circular, dated the 31st ult.:

NEW RAILS.—There have been several quite large contracts for American Rails, both Steel and Iron, closed during the past month here and in the West at fair figures, but on long time. The future appears brighter, and we trust ere long to see all our mills well employed. In Foreign the stock in this market has been concentrated in the hands of one or two par-

ties; about one-half is already disposed of for Canada, the balance held at advanced figures.

Foreign Iron Rails	gold,	$50·50 @ $56·00
*American Iron Rails	currency,	48·00 @ 50·00
Import at N. York this month, tons,		....
Previously since January 1	"	....
Total to date	"	....
Same time, 1874	"	....
Foreign Steel Rails	gold,	$80·00 @ $81·00
*American Steel Rails	currency,	74·00 @ 75·00
Import at N. Y. this month, tons,		....
Previously since Jan. 1	"	....
Total to date	"	....
Same time, 1874	"	15,905

OLD RAILS.—No sales worthy of note. Several quite large parcels are offered at our quotations without finding buyers. We think lower figures may be looked for as soon as navigation opens, and the railroads begin to take them up.

Double Heads	currency,	nominal.
T or Flange	"	$29·00 @ $30·00
U or Bridge	"	nominal.
Import at New York this month, tons,		....
Previously since January 1	"	....
Total to date	"	....
Same time, 1874	"	65

SCRAP IRON.—Quite a business has been done, and the stock for immediate delivery is very much reduced and held by one or two parties at our figures.

No. 1 Wrought ..... currency, $34·00 @ $36·00

PIG IRON.—In American the demand does not increase and it would be difficult to find a buyer either speculative or consumptive willing to purchase in excess of his immediate requirements. In Scotch nothing being done except by the dealers purchasing a few small parcels as they are offered to arrive, and at low figures.

American Forge	currency,	$23·00 @ 25·00
No. 1 Foundry	"	27·00 @ 28·00
No. 2 Foundry	"	25·00 @ 26·00
Scotch No. 1 Foundry	"	33·00 @ 37·00
Import of Foreign this month, tons		1,800
Previously since January 1st	"	2,510
Total to date	"	4,310
Same time, 1874	"	10,361

* These prices represent, as nearly as possible, the range, according to location of mill.

METALS.

Copper.—There is a report that 250 tons of Lake Copper have been bought for Hamburg within the past week at something like 21¼c. @ 21⅜c., which figure at the decline in the gold premium that has been going on in the meantime would seem a rather stiff one for export to Europe. But, however this may be, there seems to be a well concerted plan to ship off to Europe to the extent of 5,000,000 pounds distributed over the months of June, July, August and September. The prospective shipping off of that much Copper would of course change the entire aspect of the market, and cause it to rise under the stimulus of the anticipated demand from consumers. Aside from the above sale of 250 tons for export, some 200,000 pounds Lake have found purchasers at 21¾c. @ 22c., at which latter price the market closes firm. Nothing has been done in "futures." Baltimore, after selling at 21½c. @ 21¾c., the range of 21¾c. @ 22c. is now asked for. Accounts are to hand from England by mail up to March 27th. On the 20th ultimo the Chili charters for the fore-half of March were telegraphed, having again been but 1700 tons. These moderate shipments on the West Coast since January 1st would, with an active business, have started an upward tendency on the other side, but trade there is reviving but slowly, although it is known that the stocks in the hands of consumers are light. The latest official cable quotation toward the close of last week was £80 for Chili Bars, and £87. 10/ for Best Selected. There has been a steady market here in the manufactures of Copper, which we quote as follows: New Sheathing, 28c.; Bolt and Braziers, 30c.; Bronze and Yellow Metal Sheathing, 21c.; and Yellow Metal Bolts, 28c.; net cash.

Tin.—We have to report another quiet week in this metal, the transactions having been confined to a moderate jobbing business, with nothing transpired in larger lots, either on the spot or to arrive. We quote as follows: Straits, 20½c. @ 20⅝c.; English Common, 20⅛c. @ 20⅜c.; English Refined, 20¼c. @ 20⅜c., and Banca 24½c., all gold. Stocks of Tin and amounts afloat may be called average ones. The European markets have been rather weakened by the result of the Dutch sale on the 31st ultimo, where Banca brought 52⅛ guilders and Billiton 51. Per cable from London to-day Straits is quoted at £86, and Common English £94, thus the recovery in the former from the lowest previous point this year is again reduced to £2 per ton. We have seen a passage from a private letter, dated March 25, which reads as follows: "Straits Tin has advanced to £90, on the spot, and £89 afloat, this being the result of speculation, but the supplies are large and we look for no permanent advance in price." Tin Plates have been dealt in to a limited extent only, in a jobbing way, but are fully sustained at our previous quotations, which we repeat: Charcoal Bright, $9·75 @ $10·00, gold, per box; ditto Ternes, $8·62½ @ $9·00; Coke Tin, $7·62½ @ $7·75; and ditto Ternes, $7·25 @ $7·50; all gold.

Lead.—Aggregate sales for the week have not exceeded 75 tons Domestic, at 5⅞c., gold. We quote the market nominally 5¾c. @ 6c., gold. The Western market has fallen till Soft Missouri for corroding purposes sold out there at 6¼c., currency; laid down here, 6·80c., currency, the latter equal to about 5·90c., gold. Common Western is offered at 6·70c., currency, delivered here, equal to about 5·85c., gold. Europe is down to £20. 10/, which, at the exchange of $4·86, is equal to 6½c., gold. We quote ordinary Foreign, 6¾c., gold, nominally, as we hear of no business done. As yet, trade out West is dull; when it picks up, there will be less offering here from that quarter, and our market may then assume greater steadiness, and prices may not as easily recede as they occasionally do at present, especially when we ourselves resume activity in the metal. There is no change in the manufactures of Lead, which are sustained at the following rates: Bar, 8⅝c.; Pipe, 9c.; and Sheet, 9½c., less 10 per cent.

Spelter.—An effort has been made to get the market better under control, and some 50 to 75 tons Domestic have been taken out of the market at between 6½c. and 6¾c., currency, now 7c. @ 7¼c., currency, asked, under some combination reported made with producers. We have frequently expressed our opinion to the effect that we considered the lately ruling figures ruinously low, and trust that the producers may succeed in once more placing their business on a paying basis. Whether this first attempt to do so will prove successful will depend on the general development of spring trade; dull as we are, it is not easy to get from consumers more than 6¾c., currency, for Domestic. The little there was of Foreign we hear simultaneously changed hands at 7c. @ 7¼c., gold, which thus remains the altogether nominal quotation, pending a replenishment of stock. The De Metz Refined Spelter manufacture is to be re-inaugurated in our neighborhood under the auspices of Messrs Lucius Hart & Co.; it is expected to bring 10c. per pound. Sheet Zinc is dull at 9c. @ 9½c., gold.

Antimony.—The stock of both Foreign and Domestic is light, and the article, though quiet, is firm at 12¼c. @ 12½c., gold, as to quantity. London firm and unaltered.

COAL.

We have but little change to record in the market for Anthracite this week. Supplies are becoming rapidly reduced, and business continues in an unsettled condition. The inquiry for Bituminous has considerably improved, and there is a fair business doing at unchanged rates.

The following are the prices charged by the Delaware & Hudson Canal Company for Coal delivered on board vessels, at either Rondout or Weehawken, during the month of April, per ton of 2240 pounds: Furnace (Lump), $4·60; Steamer (Lump), $4·70; Grate, $4·80; Egg, $4·95; Stone, $5·40; Chestnut, $4·40.

The Chesapeake & Ohio Canal Company has resolved to reduce the tolls and wharfage on Coal from Cumberland to Georgetown from 59 to 51 cents per ton. The freight is $1·35. This will enable the canal company to transport Coal from Cumberland to Georgetown for $2·21½ per ton.

The charge by the Baltimore & Ohio Railroad Company, including wharfage, is $2 45 per ton to Baltimore.

The quantity sent from the Schuylkill region for the last week was 9278 tons, against 85,692 tons for the corresponding week last year. Decrease, 76,414 tons.

The supply sent from all the regions so far this year is 2,738,562 tons, against 3,464,552 tons to same period last year. Decrease, 725,990 tons.

We quote as follows: Anthracite, $4·60 @ $5·50; Cumberland, $6·50 @ $6·75; West Virginia, $6·50 @ $7; James River Steam, $6·25; James River Carbonite, $9; Kanawha House, $14·25; American Gas, $7 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $7·25; Murphy Run, $7·40; Newburg Orrel, $7·50; Sterling Ohio, $12; Ince Hall, $17 @ $18; Liverpool House Cannel, $17 @ $18; Liverpool Gas, $11; Newcastle Gas, $7·25 @ $8; Scotch, $9.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending April 5, 1875:

Hardware.

Boker Hermann & Co.
Mdse. pkgs., 14
Guns, cs., 7
Cutlery, cs., 4
Baldwin Bros. & Co.
Gun barrels, cs., 6
Conroy, Bissett & Co.
Cases, 1
Field A. & Co.
Mdse. pkgs., 11
Packages, 8
Anvils, 200
Friedmann & Lauterjung
Mdse. pkgs., 3
Cutlery, cs., 5
Guental G. & Son,
Casks, 3
Harris E. S.
Guns, cs., 3
Hildick A. H.
Chains, cks., 6
Chains, pcs., 2
Anvils, 1
Vises, 12
James F. & Co.
Gun caps, cs., 4
Laughland & Co.
Wire, pkgs., 7
Lau & Garlichs.
Arms, cs., 1
Lamarche H.
Arms, cs., 21
Merchants' Dispatch Co.
Arms, cs., 6
Iron guards, cs., 1
Mason John W. & Co.
Wire rope, coils, 12
Quackenbush, Townsend & Co.
Chains, cks., 11
Russell & Erwin Mfg. Co.
Files, cks., 2
Schoverling & Daly,
Arms, cs., 10
Schuyler, Hartley & Graham,
Per. caps, cs., 4
Turnor R. A.
Packages, 7
Tiebout W. & J.
Chains, cks., 10
Utchinson John W.
Arms, cs., 12
Wiebusch & Hilger Mfg. Co.
Mdse. pkgs., 13
Chains, cks., 13
Cutlery, cs., 4
Waefalser & Duyster,
Iron hook nails, cks., 134
Walsh, Coulter & Flagler,
Mdse. pkgs., 25
Order.
Cases, 4
Files, cks., 11

Iron.

Corners James & Sons,
Scrap, tons, 42⅝
Darrell & Co,
Wheels, 59
Harrison W. G.
Cast, lots, 1
Irwin Richard & Co.
Pig tons, 200
Laughland & Co.
Hay bands, bdls., 465
Marquez Fco.
Boxes, 1
Naylor & Co.
Sheets, 54
Prosser Thos. & Son,
Tubes, bdls., 31
Phelps, Dodge & Co.
Sheet, bxs., 169
Order.
Pig, tons, 600
Sheet, cs., 13

Steel.

Eagleton Mfg. Co.
Rods, bdls., 115
Howe & Co.
Cases, 3
Bundles, 3
Hugill Chas.
Mdse. pkgs., 126
Naylor & Co.
Scrap, tires, tons, 38
Scrap, rail'y springs, tons, 16
Woodford W. O.
Cases, 23
Order
Scrap, spring, tons, 100
Bundles, 245
Scrap, lots, 1
Rods, bdls., 106

Metals.

Bruce & Cook,
Tin plates, bxs., 681
Byrne Joseph & Co.
Tin, ingots, 561
Tin plates, bxs., 310
Darrell & Co.
Scrap, metal, pkgs., 16
Dickerson J. S.
Tin plates, bxs., 345
Lamarche H.
Rolled zinc, cs., 14
Rolled zinc, cks., 150
Naylor & Co.
Tin plates, bxs., 1137
Phelps, Dodge & Co.
Mdse. pkgs., 6526
Tin plates, bxs., 8925
Wheeler E. S. & Co.
Tin plates, bxs., 236
Order.
Tin, ingots, 2059
Lead, pigs, 2710
Lead, bars, 4
Tin plates, bxs., 11,090
Tin and terne plates, bxs., 2915

OLD METALS, PAPER STOCK, &c.

Business in this market has been very dull the past week, and prices remain the same as quoted in our last report. Old Metals are still unchanged, with the exception of Copper, which is in moderate request. Grass Rope is in better demand, and prices have an upward tendency. Other articles present no material change. We quote the following as the current purchasing rates:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5¼c.; Tea Lead, 4½c.; Zinc, 4¼c. @ 4½c.; Pewter, No. 1, 18c.; do., No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¼c.; Sheet do., ½c.; Cast, do., ½c.; Machinery, do., ¾c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No 1, 6c. @ 6½c.; No. 2, 2½c.; White, No. 1, 6½c.; No. 2, 4½c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5c.; Gunny Bagging, 1c.; Jute Butts, 1⅝c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c.; Oakum Junk, No. 1, 4⅛ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 2½c. @ 2¾c.

PITTSBURGH.

PITTSBURGH, April 6, 1875.

The Iron trade has not varied since the date of my last report. Business is almost entirely suspended, more so perhaps than at any time since the lock-out was inaugurated. There is nothing doing in raw Irons worthy of the name, as the strike affects Foundry grades as well as Gray Forge. Prices are nominally unchanged, as follows: No. 1 Foundry, $27 to $28; No. 2, ditto, $25 to $26; Gray Forge, $22 to $24; White and Mottled, $20 to $22. The mills are virtually out of the market, and will stay out while the strike continues, as there is no disposition to anticipate future wants in the present condition of affairs. As regards Manufactured Iron and Nails, there is nothing new to report. Business continues, so far as Pittsburgh is concerned, considerably demoralized. There are but very few orders coming forward, nor is it to be expected, as it is generally known that in consequence of the strike there is no stock here. Some of the mills that have their specialties are still able to supply the immediate wants of regular consumers. All of the nail factories are stopped, and the retail trade here are obliged to order from competing points; the stock of Nails has not been so much reduced here for many years. It is said that Wheeling is anxious to put up prices, which have been ruinously low all winter, but it is not likely that she will, in the present condition of affairs, receive much encouragement in this respect from Pittsburgh. The steel mills are all in operation, some of them working up to their full capacity, and about the only complaint is in regard to prices, which it is said afford little or no margin for profit.

MUCK BAR—Is not so much sought after, the recent advance having curtailed the demand, and, beside, it is said that it is not giving satisfaction as regards quality.

SCRAP IRON—Is also easier, several of the largest buyers having stopped, and prices are weaker. Sales of No. 1 wrought reported at 1⅝c per lb.

THE LOCK-OUT.—In regard to the lockout, there is no scarcity of rumors; one day the puddlers have succumbed, while the day following it is the manufacturers. There is no question but what both sides are very anxious to have it ended, as they are both suffering from its consequences, but as yet there is no disposition manifested to yield, or even to compromise, and the feeling appears to be growing more determined to hold out.

The Pittsburgh *Commercial*, of April 3, says: We can note no change in the market for raw Iron this week, as the lock-out still continues. There is very little metal being used. The price remains about the same as at date of last report, and $24, four months, may be fairly quoted as the price for Gray Forge Iron. There are still some sales of Muck Bar, and we hear of several lots that were offered at $44 and $45 per ton without finding purchasers. We are reported the following sales:

MUCK BAR.

500 tons muck bar, neutral	$43·86—cash.
150 tons muck bar, neutral	44·00—cash.
100 tons muck bar, neutral	44·00—cash.
100 tons muck bar, neutral	private terms.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

200 tons gray forge	$24·00—4 mos.
80 tons gray forge	24·00—4 mos.
40 tons No. 2 foundry	25·50—4 mos.
20 tons No. 1 foundry	27·00—4 mos.

ANTHRACITE.

20 tons No. 2 foundry	$25·00—cash.
10 tons No. 2 foundry	25·00—cash.

CHARCOAL.

10 tons Lake Superior	$33·00—4 mos.
10 tons Eastern cold blast	38·00—4 mos.

BLOOMS.

20 tons Missouri	$78 00—4 mos.

SCRAP IRON.

The demand has been well maintained at prices that have ruled for some time past. Several sales were made at prices noted below. We quote as follows:

Car wheels	$34·00 @ 35·00
Light Scrap	28·00 @ 30·00
No. 1 axles	38·00 @ 40·00
No. 2 car springs	40·00
No. 1 molding metal	18·00
No. 1 railroad scrap	28·00
No. 2 " "	25·00
Stove pipe and light iron	14·00
No. 1 wrought scrap	30·00

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of April 5, writes us as follows: The market is quiet, but without any indications of any change of price. The usual time, 4 mos., is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$28·00 @ 29·00
" 2 " " " "	26·00 @ 27·00
" 1 Mill, " " "	25·00 @
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	26·00 @ 27·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @ 26·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	25·00 @

HOT BLAST STONE COAL AND COKE.

No. 1 F'dry, from Hanging Rock Ores	$27·00 @ 28·00
" 2 " " " "	25.00 @ 26·00
" 1 Mill, " " "	24·00 @ 25·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	26·00 @ 27·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	25·00 @ 26·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	24·00 @ 25·00
No. 1 F dry, from Missouri Ores	28·00 @ 29·00
" 2 " " "	27·00 @ 28·00
" 1 Mill, " " "	27·00 @ 28·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	40·00 @ 50·00
" " Tennessee Ores	35·00 @ 37·00
" " Alabama Ores	38·00 @ 40·00
" " Georgia Ores	38·00 @ 40·00
" " Kentucky	30·00 @ 42·00

CINCINNATI.

Messrs. L. R. HULL & Co., under date of April 5th, write us as follows: PIG IRON.—Holders of favorite brands of charcoal metal continue firm, but large sales of this grade are difficult to effect at current quotations, which are regarded by manufacturers as higher than the state of their trade will justify. Forge Irons are in light supply and firm. There is rather more sale for Cold Blast metals.

HOT BLAST CHARCOAL.

Hanging Rock No. 1 ℔ ton	$28·00 @ 29·00—4 mos.
" " No. 2	26 00 @ 27·00—4 mos.
" " Forge	25·00 @ 26·00—4 mos.
Tennessee No. 1	26·00 @ 27·00—4 mos.
" Forge	25·00 @ 26·00—4 mos.
Alabama No. 1	26·00 @ 27·00—4 mos.
Missouri No. 1	28·00 @ 29·00—4 mos.
" No. 2	27·00 @ 28·00—4 mos.

HOT BLAST STONE COAL.

Missouri No. 1 ℔ ton	$28·00 @ 29·00—4 mos.
" Forge	26·00 @ 27·00—4 mos.
Mahoning No. 1	28·00 @ 29·00—4 mos.
" Forge	25·00 @ 26·00—4 mos.
Am. Scotch, No. 1	26·00 @ 28·00—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel ℔ tn.	$35·00 @ 50·00—4 mos.
Missouri " "	45·00 @ 45·00—4 mos.
Kentucky " "	40·00 @ 42·00—4 mos.
Tennessee " "	36·00 @ 42·00—4 mos.
Georgia " "	40·00 @ 42·00—4 mos.
Alabama " "	40·00 @ 42·00—4 mos.
Machinery and Forge	40·00 @ 42·00—4 mos
Blooms	70·00 @ 90·00—4 mos.

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of April 2, report the Iron market as follows: There is no special change to note. The demand for both Foundry and Mill Irons has been light the past week. There exists, however, a better feeling amongst Iron men in regard to the future. Our prices are firm at last week's quotations. We quote on four month's time:

Mo. Stone Coal, No. 1 F'dry	$30·00 @ 32·00—4 mos.
" " No. 2 F'dry	28·00 @ 30·00—4 mos.
" " No. 1 Mill	26·00 @ 28·00—4 mos.
" Charcoal, No. 1 F'dry	30·00 @ 33·00—4 mos.
" " No. 2 F'dry	28·00 @ 30·00—4 mos.
" " No. 1 Mill	26·00 @ 29·00—4 mos.
" " Nos. 4, 5 & 6	31·00 @ 35·00—4 mos.
Tenn. Charcoal No. 1 F'dry	30·00 @ 35·00—4 mos.
" " No. 2 F'dry	28·00 @ 30·00—4 mos.
American, Scotch, "Cherry Valley" No. 1 Foundry	39·00 @ 43·00—4 mos.
American, Scotch, "Cherry Valley" No. 2 Foundry	36·00 @ 38·00—4 mos.
Massillon, No. 1 Foundry	37·00 @ 39·00—4 mos.
" B, No. 1 Foundry	35·00 @ 36·00—4 mos.
" No. 2 Foundry	34·00 @ 36·00—4 mos.
Cold Blast Car Wheel, Mo	40·00 @ 42·00—4 mos.
" " Tenn.	40·00 @ 45·00—4 mos.
" " Hanging Rock	53·00 @ 55·00—4 mos.
Mo. Charcoal Blooms	75·00 @ 85·00—4 mos.
No. 1 Wrought Scrap	1¾c. per lb.
Machinery Cast "	1c. "
Stove Plates	¾c. "

RICHMOND.

Asa Snyder, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of April 2: The receipts of Charcoal Iron during the past month for sale on this market equals 1200 tons. Prices are fully $3 per ton higher than one month ago. Present quotations are for Cold Blast Charcoal:

No. 1 and 2, Car Wheel Irons	$30·00 @ 35·00
No. 3 and 4, " "	29·00 @ 33·00
No. 5 and 6, " "	28·00 @ 32·00
Virginia Anthracite, No. 1 ex	30 00 @ 31·00
" " No. 2 ex	28 00 @ 29·00
" Coke, No. 1 ex	27·00 @ 28·00
" " No. 2 ex	26·00 @ 27·00

CLEVELAND.

Messrs. C. E. BINGHAM & CO., 25 West Main street, under date of April 5, quote the Iron market as follows, 4 mos. time:

LAKE SUPERIOR CHARCOAL.

No. 1	33·00—4 m.
No. 2	32·00—4 m.
No. 3	33·00—4 m.
No. 4	34·00—4 m.
Nos. 5 and 6	34·50—4 m.

BITUMINOUS FOUNDRY.

No. 1 Foundry	$28·00—4 m.
No. 2 Foundry	26·50—4 m.
No. 1 Gray Forge	25·00—4 m.

AMERICAN SCOTCH.

No. 1, Cherry Valley	$32 00—4 m.
No. 2, "	28·00—4 m.

MASSILLON.

Massillon No. 1	$31·00—4 m.
B—1	29·00—4 m.
Massillon No. 2	27·00—4 m

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of April 6: Trade rules much as reported for some time past. There has been some Southern merchants in the market, but orders are limited, and placed with caution. The spring demand may be quoted as poor and disappointing. List unchanged.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick, 1 to 4½ wide by 1½ to 2 thick	2·6-10 to 2 7-10c. ℔ lb.
Round and square, ordinary sizes, from ⅜ to 2 inclusive	2 6-10 to 2 7-10c. "
Hoop Iron, 1½ wide and upward	4¾c. to 4¾c. "
Band Iron, from 1¼ to 4 in. wide	3¾ to 3¾c. "
Horse Shoe Iron ⅜ to 1 wide by ⅜ to ½ thick	4 to 4¼c. "
Norway Nail Rods	6¾ to 7c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15½ to 16c. "
Machinery Steel	11 to 11¾c. "
Cast Spring Steel	10 to 10½c. "
Homogeneous Steel Plate	10½c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·62½
" Mule Shoes " "	6·62½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6
Putnam Horse Nails	23	24	25	26	28c. per lb.
	10	9	8	7	6
Globe Horse Nails	23	24	25	26	28c. per lb.

R. R. Spikes 5¼ by 9-16 at 3c to 3¼c. per lb.

BOSTON.

BOSTON, April 3.—*Pig* is still without inquiry or any encouraging disposition beyond the effect of the reports from the producing points. These stimulate holders to a fair degree of firmness on values, but make no impression on foundrymen, who still lack the avenues for moving out castings did they start up their stacks. A number of our leading architects have been collecting estimates on iron fronts for new blocks to go up in the near-by-cities and towns when the frost comes out of the ground; building materials and labor being now remarkably low and capital idle and cheap. It is not improbable something in April may be done in the architectural way to encourage Pig Iron makers. Prices here quote $32 @ $33 for fancy brands. The primary markets still quote $27 @ $28 for No. 1; $24 @ $26 for No. 2, and Gray Forge, $24 @ $27; this latter brand being still relatively high from its apparent scarcity. Scotch Pig has no business, but quotes Eglinton $34 @ $35; Glengarnock, $37. *Bar* is in better supply. The Buffalo makers have let down values a trifle and started up; our receipts have been wholly from that point, and cover about 800 tons landed and 1000 to arrive. This has sorted up stocks, but has not depressed prices nor quickened nor slackened the demand. The business doing is still of a sort of a blacksmith, picayune nature. The current of sales is steady, but the single bills are very small. For Refined, $60 is the general asking price, with perhaps a little less disposition to shade, as dealers insist their margin now to land is not a dollar per ton, to which are to be added handling, storing, etc. In boiler plates a fair business is doing. We quote Bay State flange, 5¾c., do. C. No. 1, 4¾c.; Pennsylvania flange, 5½c.; do. C. No. 1, 3⅝c. In boiler pipes a small inquiry exists, the agreement on lap welded being maintained, quoting 2 inch 20c., and 3 inch 31c., net. Gas pipe is low and not very brisk, parties stating their ability to purchase at 5c. per pound, quality guaranteed at 2 lbs. per foot. *Steel* is moving along in a quiet, steady way, the small tool makers taking a little more interest. We quote American Tool, 15c. @ 15½c.; American Machinery, 9½c @ 10c.; do. Tires at 6½c. @ 7c.; English Tool, 16c. @ 17c. *Copper* has had a trifling inquiry, but as yet no business. The business discussed is in futures, on which values do not vary from 21½c. @ 21¾c. The same as govern spots. We quote New Sheathing, 28c.; Bolts and Braziers, 30c.; Yellow Metal Bolts, 28c. *Lead* is very dull and easy, lots of Domestic still offering from New York at 5¾c. Sheet and Pipe, 9c., currency; Tin Lined Pipe, 16½c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Spelter* is easy at 6½c., currency. *Tin* is quiet and unchanged, possibly a little better feeling, but without any change to quotations, nor any inquiry seeking lots. We quote at 21½c. @ 22c., gold, for Straits. Refined English is unchanged for 21c., @ 21½c., gold. Plates are active; we quote Charcoal, I. C., $10 @ $12·50; Coke, $8 @ $10; and Terne at $8 @ $12·50 per box, currency.—*Commercial Bulletin.*

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, March 21, 1875.—*Metals.*—The recent London failures, aggregating, between the three firms' liabilities, to the amount of £2,600,000, together with the revival of the speculative mania on our own and the remaining Continental exchanges, have not failed to intensify the feeling of extreme caution in European metal circles. Values have not been affected by the failures to any appreciable degree, but as it is pretty much certain that we shall soon receive news from South America that they have involved others there, or even in the East Indies, where two of the firms alluded to were also related in business, it cannot as yet be determined what may be the eventual effect of such wide-spread losses. While therefore the basis which underlies the metal trade, *i. e.*, the supply and growing necessities, may be considered in a healthy condition, as we have had occasion to fully explain in previous reviews, there are now coming to pass certain financial occurrences which may well cause our dealers and consumers to pause and adhere to the conservative policy they have clung to during the winter months. *Copper.*—Copper has moved off with extreme difficulty here, and prices are weak at the following quotations: Chili Bars, deliverable at Havre, 212·50 francs; Common do., 207·50; Ingots, 225; English Tough Cake, 230, and pure Corocoro Ore, 212·50. Nothing is going on at Havre, where first brands are quoted 215; current ones, 212·50, and Lota and Urmeneta, 210. Marseilles is decidedly weaker, since the recent more favorable views that had obtained there, at nominally 220, Refined Ingots. *Tin* has been the subject of a great operation for a fall, and Straits for the moment actually declined to £84, at London, from which point it has recovered £3. We have been steady here at the following rates: Banca, deliverable at either Havre or Paris, 245 francs; Straits, 230; and English, at Havre or Rouen, 230. Marseilles is quiet, without a sale reported, at 240 for Straits and Billiton. *Lead.*—The steady decline that has been going on in England and at Marseilles has not failed to demoralize pretty much all the remaining European Lead markets. At Marseilles there has been a steady accumulation of stock, and a disagreement having occurred simultaneously among the manufacturers, quite a decline has resulted therefrom. Little has transpired here, but rates are, nevertheless, sustained at between 55 and 56 francs the 100 kilos, between Paris and Havre. Consumption is now at a stand-still at Marseilles, where the price has gone down to 49 francs. *Spelter* has been quiet in the various markets. A new mine has been discovered in Poland. But a moderate business has been transacted at well sustained prices at Paris and Havre at 59·50 to 59·75 francs here, and at 60 to 61 the 100 kilos at Havre. *Iron.*—One of the principal causes which had retarded the revival of activity in the Iron trade in France had to be searched for in the late uncertainties about the political situation, now happily removed. Building is now on the increase, especially here, and architectural Iron work is looking up. St. Dizier and the Champagne are firm, the Loire and Rhone districts less so; Common Pig in the Muerthe and Moselle, 76 francs; Sheet Iron, 217 at the works. *Coal.*—Generally quiet and unaltered. The production of Coal in France in various important districts is decidedly on the increase, and several companies are building branch lines of railways at their own expense, without government aid, in order to facilitate the sale of their product.

BELGIUM.

(Revue Universelle).

BRUSSELS, March 21, 1875.—*Iron.*—The hopes that had been founded on the Welsh lock-out have not been fulfilled, and, unlike the French Iron districts, where a slight amelioration is apparent, dullness has continued to rule in those of Belgium. The Central Rolling Mill at Louviere has just furnished its works with a handsome differential rolling train after the Lauth and Deby system, enabling it to produce between 20 and 25 tons of Sheet Iron every 24 hours. A new sensation is the introduction of compressed air locomotives to be adopted on some English tramways in connection with powerful steel springs, intended to supersede the use of horses. The reports relating thereto are so sanguine, and sound so well on paper, that we prefer to hear of the practical working of the new system, ere we attach much importance to the scheme. The inventors pretend to use a speed of 30 miles to the hour, if required, and even to dispense with Rails. *Coal.*—There is little or no alteration, if anything a tendency toward lower figures in the Charleroi district, where fine Coal has largely accumulated, while Iron and Glass industry remains paralyzed. Belgian Coal miners will now, as they usually do early in spring, resort to brick makers' work for a while, and a further material increase of stocks will thus be counteracted.

RUSSIA.

(Golos.)

MOSCOW, March 15.—*Iron and Metals.*—According to the official government statistics the State foundries smelted in 1874: 1,225,000 poods of Bronze, the pood weighing 36 pounds English; 557,000 poods of Iron, and 1000 poods of Steel. There were cast 80,000 poods weight of articles in Bronze, 9000 poods weight of Steel, connon, and 15,000 poods weight of Iron, connon; 15,000 poods of Lead, and 6600 poods of Zinc were smelted; 7800 poods weight of Iron articles; 10,000 poods weight of Sheet Iron; 46,700 side arms, 20,000 blades, and 5725 gun barrels. The productions of the Ural private establishments are estimated at 13,200,000 poods of Bronze, 1,017,000 poods of Iron, 69,000 poods of Steel, and 100,000 poods of Copper. Those around this city are valued as having turned out 3,360,000 poods of Bronze, and 1,830,000 poods of Iron. South Russian production is estimated at 430,000 poods of Bronze, and 440,000 poods of Iron; that of the Polish provinces at 1,370,000 poods of Bronze, 800,000 poods of Iron, and 130,000 poods of Zinc. Furthermore, the Caucasus has turned out 44,000 poods of Copper. The total amount of *Coal* and Anthracite raised in 1874 was 83,375,000 poods. Reducing the amounts given to English tons of 2240 pounds each, it will be seen that Russia produced in 1874: 74,636 tons Iron, 313,000 tons Bronze, 2314 tons Copper, and 2034 tons Spelter, beside 1,340,000 tons Coal.

GERMANY.

(Borsenhalle.)

HAMBURG, March 20, 1875.—*Metals.*—The German markets have remained quiescent during the week. *Copper.*—Very little has transpired in our midst. We quote Drontheim here 94 marks, nominally, and Minnesota 106. *Tin* has been inactive, and has undergone no change. *Lead* is decidedly weak here, German at 23·75 to 24·50 marks, and English at 26. Stettin has been comparatively steady at 24 for German, and 27 Spanish. *Spelter.*—There has not been much doing in the German markets; we remain quiet and nominally at 25 marks, here, for Silesian, while Breslau is firm, but inactive without change. Stettin is steady at 27 marks. According to the report of Mr. Goubitsky, engineer of the first subdivision of Poland, a zinc mine has been discovered by him at Smolene, in the district of Alkoushy.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, March 20, 1875.—*Tin.*—But a limited business doing at 52 guilders deliverable from the impending sale; spot Billiton, 49¾.

CHINA.

(Arnhold, Karberg & Co.)

CANTON, Feb. 3, 1875.—*Metals. Lead.*—The improving tendency noticed in our last circular has continued, and a fair quantity has been turned over at fully previous and, in some instances, rather stiffer rates. Stocks on hand are moderate, and it is not unlikely that the article may further improve at the approach of the tea season. *Tin* is rather firmer. *Quicksilver.*—Telegrams of a serious decline, and a still falling market at home, have stopped operations in this article, and it is a matter of impossibility almost to give true quotations. Stocks are heavy, being estimated at about 2000 flasks, and future prospects are, indeed, very gloomy. We quote: Lead, $7·50 to $7·75 per picul; Tin, $23·50 to $23·50, and Quicksilver, Spanish, $207 to $208: California, $210 to $211. Exchange on New York, 5 months' sight, 5 per cent. discount.

EAST INDIES.

(Gilfillan, Wood & Co.)

SINGAPORE, Feb. 10, 1875.—*Tin* has declined to $24·65 per picul, at which the demand is not active. The Verona for New York, took 1591 piculs, the Glamorganshire for Boston, 3063. The Jupiter T. for New York, is still loading; there is no vessel on the berth for Boston. Exchange, 4/2⅛ to 4/2⅛.

(Aitken, Spence & Co.)

COLOMBO, Feb. 24, 1875.—*Plumbago.*—A moderate inquiry still exists for the United States; supplies in the market small. The Egbert and Umgeni are proceeding slowly with their loading, and it is not yet decided whether the latter will fill up at Aleppi or not. We quote on a steady, but quiet market, the three kinds free on board, 336, 189 and 126 shillings. Exchange, 1/10¼.

Sandilands, Buttery & Co.)

PENANG, Feb. 13, 1875.—*Tin.*—The market was in the beginning pretty firm at $24·10 to $24·05 per picul for unsmelted, but, owing to unfavorable advices from London, European buyers kept off and Chinese speculators commenced purchasing at $23·95 per picul, which was the closing quotation or departure of the last mail. Since then transactions to a smaller extent took place at prices ranging from $24·05 down to $23·85. The market closes very quiet. Stocks in the Bazar are estimated at about 7000 piculs. *Exchange*, 4/2⅛c 4/3.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., March 22, 1875.

TRADE PROSPECTS

are not materially brighter than they were when I last wrote on your behalf, nor do I see that any material alleviation of the present dull state of things will take effect until there shall have been declared a clear drop in prices. At present the British iron masters would appear to be toying with trade. They are too coy, or too avaricious, to make a bold stroke toward regaining the connections they have lost during the last two years, by initiating a policy of such a nature as had, at one time or other, been efficacious in securing customers in various parts of the world. They will, apparently, insist upon obtaining their 15 or 20 per cent. of profits, or none at all, a remark which has especial application to the finished iron producers. For instance, Messrs. Barrows and Earl Dudley retain their list prices at £11. 12/6 for their well known branded iron, consequently, other branded iron is held at £11, nominally, at any rate. Yet these latter brands rule the market, and their owners are well aware that an official reduction on their part would not only redound to their own pecuniary advantage, but would give a sensible stimulus to the whole Staffordshire iron trade. Now that miner's wages have been reduced throughout the whole kingdom, there is no excuse whatever for the retention of existing figures by the Staffordshire producers, and, as that district leads the finished iron trade of the kingdom, producers are anxiously looking forward to the quarterly meetings in the expectation that prices will drop £1. 10/ per ton all round. Merchant buyers flatly assert that they will still withhold orders unless this consummation should come about.

IRON AND STEEL INSTITUTE.

The annual general meeting of the members of the Iron and Steel Institute will be held at the offices of the Council of the Institution of Civil Engineers, 25 Great George street, Westminster, on Wednesday, Thursday and Friday, May 5th, 6th and 7th. The Council of the Institute announce that they are open to receive communications bearing upon the iron and steel trades from gentlemen desirous of submitting papers to the meeting. Persons desirous of becoming members can send in their proposal forms up to the middle of April. I may say, further, that the Manchester members of the Institute have invited the Institute to hold its next autumn meeting in that city, and have received an acceptance of their invitation. Special arrangements are, in consequence, being made for visits and excursions in the neighborhood, where there are some of the principal engineering establishments in the United Kingdom. Manchester, which does these things *en prince* is sure to give the Institute a magnificent reception.

LOSSES OF THE CHILINGTON IRON COMPANY.

The annual report of the Chilington Iron Company, a leading Staffordshire concern, states that the strike of miners in that district has caused a loss of £10,000 to the company. Part of this will be made up from the reserve fund, and the remainder will be neutralized by the directors foregoing half their remuneration for the year 1874.

TROUBLES OF A "LIMITED" COLLIERY COMPANY.

Unlimited troubles appear to be the lot of many of the companies in this country which have "Limited" affixed to their designations. These mostly originate in the manner in which they have been got up and "floated." An instance in point is furnished by the Silkstone Fall Colliery Company, "Limited" which has been in existence very little more than a year and is a product of the recent coal famine. At the meeting held in Barnsley on Friday, the chairman stated that the concern was in a desperate financial condition, there being eight bills of exchange out against it, to the tune of £16,670, whilst there was only £1400 altogether owing to the company. In reviewing the history of the colliery he said that it was at no time worth more than £3000, yet in 1871 it was purchased for £30,000, after several attempts had been made to "float" it—in one case the capital being actually fixed at one million pounds! A dividend of 25 per cent. was then paid as a bait, which took well, there being immediately a great rush for shares, mostly sold through London brokers. Then this company was formed with a capital of £50,000, the prospectus stating that the Silkstone seam was being worked, whereas, as a matter of fact, it had been given up at least 40 years before, the remains being so small that none would have them as a gift. Now, therefore, it was proposed to abandon the pit altogether, and only to carry on the brickworks for the purpose of working up a thin seam of fire-clay. The capital to be employed for this purpose would not exceed £1400! This, I submit, for this slow-going old British country is not so bad after all. Had the matter been on your side the Atlantic, I have an idea that our press would have expressed its virtuous indignation in a very outspoken manner. As it now stands the case is far different.

COAL CUTTING BY MACHINERY.

The Newcastle *Journal* gives the following account of a new coal cutting machine at the Marquis of Londonderry's West Rainton Colliery: "At West Rainton, last week, was tried a coal-cutter of comparatively recent invention, which promises to greatly exceed in its result many of its competitors; and its success at that colliery, if sustained, will probably result in its general introduction to the district. A party of gentlemen during last week attended by invitation at West Rainton to witness a practical testing of the machine. The party included Messrs. Stratton and Turnbull, viewers, Seaham Collieries; Mr. John Dakers, Old Durham Colliery; Mr. Panton, Silksworth, and several other gentlemen interested in mining matters. Having assembled at the colliery office in the village of West Rainton, the party, accompanied by Mr. Corbett and Mr. Laverick, resident viewer, proceeded thence to the Alexandrina Pit, owned by the Marquis of Londonderry. Arrived at the shaft mouth, attention was first directed to the engine there stationed for the purpose of providing motive power to the coal-cutter by forcing compressed air through a service of pipes laid down the shaft and through the workings of the mine. This engine, which was designed and constructed by Mr. Wm. Anderson, of Chilton Moor, the resident engineer to the Rainton collieries, consists of two parts, the steam engine proper, and the air compressing machine. The diameter of the steam engine cylinder is 1 ft. 10 in., with a length of stroke of 3 ft. 6 in. The air compressing machine is simply an air pump in outward appearance, resembling to a great degree a steam cylinder, the necessary power for forcing the air along the pipes being communicated to it from the steam engine by means of a crank. The diameter of the cylinder of this air pump is 2 ft., with a length of stroke of 2 ft. 9 in. Preparatory to descending into the mine with the view of observing the coal-cutter in actual operation, we enrobe ourselves in garments more suitable to the subterranean journey we are to pursue than is our above-ground attire, and each armed with a safety lamp, we enter the cage which, with a gentle and not unpleasant motion, speedily drops us down 80 fathoms into the bowels of the earth. Skirting the way is the metal pipe in which the air is conveyed to the coal-cutter, and at one point in this pipe is a bell-shaped iron receiver, surmounted by a gauge which indicates the pressure of the compressed air. Passing along this driftway in a southerly direction for about a quarter of a mile, we at last emerge into the workings proper of the pit, and continuing our course with difficulty, from the extreme lowness of the roof, for another quarter of a mile, we reach the coal face at which the cutter is stationed, and upon which it is to be tested. The piping by which the compressed air is conveyed to this point is 1216 yards in length, namely, 600 yards 5 in. metal piping, 546 yards 4 in. metal piping, and 70 yards of 2 in. india-rubber piping. The machine by which the coal cutting is effected is patented by Messrs Gillot & Copley, of Barnsley, and is constructed almost entirely of wrought iron and cast steel. It consists of a wrought iron frame 4 ft. 4 in. long, 2 ft. 4 in. wide, and 2 ft. 4 in. high. In this frame work are placed engines supplied with compressed air from the pipe, exhausting direct against the face of the working, and aiding to some extent the ventilation of the pit. The cylinders are 7 in. in diameter, with a 12 in. stroke, driving a main shaft at a speed of 100 revolutions per minute, which shaft is connected by gearing with a cutting wheel. This wheel or disc, which is 3 ft. 10 in. in diameter, is placed horizontally on one side, projecting in a shelf-like manner from the bottom of the framework of the machine, and making six revolutions per minute. Around the outer circumference of this disc there are fixed 20 teeth, graduated in size, and alternately single and double. The single teeth are curved inward at the point, while the double ones are shaped somewhat like letter U. Attached to the machine is an arrangement for securing its propulsion forward along the face as the disc cuts away the coal. This consists of a wire rope, one end of which is secured to the machine at a point near to the disc, and passing along the face through a block fastened to a prop, returns to the machine, and is wound on a drum on the fore end of the framework of the cutter, the motion being supplied to this drum by the machine as it works. The machine was stationed for trial a little over half a mile from the shaft in the Low Main seam, and at a point where the seam, including bottom stone and coal, was only about 3 ft. 6 in. in hight. Having examined minutely the construction of the machine, the gentlemen present, collier-like, settled themselves down to watch its operation. The cutter, under the charge of three men, was placed at a corner in the face, and having been started, the disc speedily worked itself out of sight in the coal strata. The revolving cutter works in the bottom of the seam, in the bottom stone and coal, and kirves in to a distance of from 3 ft. to 3 ft. 4 in., the part actually worked out being from 3 in. to 4 in. in thickness. From the space cut it effectually sweeps out, as it revolves, all the bottom stone and coal, and this, being inferior, is thrown back into the goaf, while there remains for subsequent removal a seam of good coal about 3 ft. 2 in. in thickness. Having watched the cutter work exactly an hour, the distance cut was measured, when it was ascertained that 18½ yards of the face had been kirved. The pressure of the compressed air was about 27 lbs. or 28 lbs., and the machine continued its work during the time without hitch or stoppage of any kind. The face of coal at which the machine is at present working in the Alexandria Pit is 70 yards in length, and this, after being undercut by the machine, is next morning blown down and filled up by a gang of men. The officials at the colliery propose working the machine daily, in order to further test its capability, and if, after a few months' trial, its efficiency is sustained, they propose, we believe, to bring others into the mine. Nothing could be more satisfactory than the operation of the machine at the trial, and the colliery viewers, who, from their daily experience of the coal cutter, are the best judges of its efficiency, expressed themselves as fully convinced of its practical success. If no other advantage accrued from the use of the coal cutter, there is a very material one to the coal owner which must not be lost sight of. It is found that the percentage of round in machine-hewed coal is considerably greater than it is with hand-hewed coal. To put the matter succinctly, we may state that out of every 100 tons of hand-hewed coal, 50 or 51 tons only of round are obtained, the remaining 49 or 50 tons being small. Now, of 100 tons of coal cut by the machine at this colliery, from 75 to 77 tons are round and the remainder small.

SCOTCH PIG IRON.

The Scotch pig iron market has been dull during the week, with an attendant general recession in prices, both of warrants and makers' brands. Warrants have been down to 71·9 during the past few days, but have recovered since to the extent of about 1/ per ton. As will be seen from the annexed quotations, makers' special brands are appreciably easier. Freights have again gone up, Glasgow to New York being 10/, or 2/6 higher than recent rates; Glasgow to Boston is 15/; Ardrossan to Boston, 17/; Glasgow to New Orleans, 15/; Ardrossan to New Orleans, 10/, and East Coast to New Orleans, 9/; to Baltimore from the same places is 12/, 17/6 and 14/ respectively, and to Philadelphia, 12/, 12/ and 14/. Ballast pig iron is still quoted at 55/ per ton, alongside ship. Connal's stores now contain 27,436 tons, against 38,284 tons on March 19, 1874.

Writing from Glasgow, March 23, Messrs. Wm. Colvin & Co. say: "The warrant market continued quiet at the end of last week, the price ranging from 72/ to 72/9, the latter being the closing quotation on Friday. On Monday there were some symptoms of an upward movement, but this was checked to a considerable extent by a reduction in the price of several leading brands, and business was done from 72/ to 73/1½, closing with buyers at 73/. To-day the market has been inanimate and prices irregular; 72/6, prompt cash, and 71/, 14 days fixed accepted, closing with buyers at 72/3, cash. The undernoted quotations show a decided reduction in the value of the higher priced brands."

	Deliverable alongside. No. 1.	No. 3.
G. M. B., at Glasgow	73.6 @ 74/6	72/ @73/
Gartsherrie "	83/	76/6
Coltness, "	85/6	76/
Summerlee, "	85/	74/
Langloan, "	84/	74/
Carnbroe, "	79/	73/
Monkland "	74/6	72/6
Clyde "	75/6	73/
Govan, at Broomielaw	74/6	73/
Calder, at Port Dundas	85/	74/
Glengarnock, at Ardrossan	80/	72/6
Eglinton, "	71/6	69/6
Dalmellington,"	71/6	69/6
Carron, at Grangemouth, selected	82/6	..
Shotts, at Leith	84/	76/
Kinneil, at Bo'ness	77/6	71/
Bar Iron	£9. 10/	
Nail Rods	£9. 10/	

SHIPMENTS.

	Tons.
Week ending 20th March, 1875	10,614
" 21st March, 1874	6,816
Increase	3,798
Total increase for 1875	10,499

Writing on March 19 (night), Messrs. James Watson & Co. thus reported: "The market has been quiet but steady during the week, opening on Monday at 72/6, cash, and closing to-day at 72/9, buyers, the lowest point touched being 72/. Makers have intimated further reductions in their prices. Shipments last week were 9676 tons, against 10,622 tons in the corresponding week of 1874."

	No. 1.	No. 3.
G. M. B., at Glasgow	74/6	73/
Gartsherrie, "	85/6	76/6
Coltness, "	86/6	74/6
Summerlee, "	85/6	74/6
Langloan, "	84/6	74/6
Carnbroe, "	81/6	73/6
Calder, at Port Dundas	86/	74/6
Glengarnock, at Ardrossan	83/6	74/6
Eglinton, "	74/	72/
Dalmellington, "	73/	71/
Shotts, at Leith	84/6	74/6
Kinneil at Boness	78/	71/6

The prices current of Messrs. J. E. Swan & Brothers' (limited), Glasgow, March 19th, gives slightly different figures, as under:

Glasgow Brands.	Furnaces B'wing, 123	Furnaces Out 34.	Furnaces Built, 157.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	14	2	16	85/	76/	..
Coltness	12	0	12	86/	74/	..
Summerlee	6	2	8	85/	74/	..
Langloan	7	1	8	84/	74/	..
Govan	5	0	5	74/	72/6	..
Calder	6	2	8	*85/	74/	..
Shotts Bess'mer	5	2	7	90/	85/	..
Shotts Ordinary				84/	74/	..
Carnbroe	4	2	6	81/	73/	..
Wishaw	2	1	3	..	..	..
Monkland	7	2	9	74/	72/6	..
Chapelhall				..	..	..
Clyde	6	0	6	75/	73/	..
Quarter-Clyde	4	1	5	74/	72/6	..

*f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 72/9.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	7	2	9	83/	74/	73/
Ardeer	4	1	5			
Eglinton (Brand'n Egl'n)	6	2	8			
Lugar	4	0	4	73/	71/	72/
Muirkirk	3	0	3			
Portland	3	3	6			
Dalmellington	6	2	8	72/	70/	70/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinneil	3	1	4	77/6	71/	70/
Almond	2	1	3	75/	71/	..
Carron Select'd	5	1	6	85/	..	..
Carron Ordn'y				75/	72/6	..
Lochgelly	2	2	4	72/6	71/	..
Lumphinnans	0	2	2	..	70/	68/
Bridgeness	0	2	2	..	..	..

Furnaces in blast in Scotland: 1875—123; 1874—80

TRADE OF CLEVELAND.

The monthly report of the Middlesborough Chamber of Commerce states that there are now about 62 blast furnaces in operation in that district, producing 87,439 tons pig iron, or 11,850 tons less than in the preceding month. There are four furnaces in course of erection, two at Port Clarance and two at the Redcar Iron Works. The shipments of pig iron have been much above the average for this season of the year, and the foreign exports more than doubled, particularly to Belgium and Holland. The manufactured iron departments experienced a much better demand during the month, the rail trade having been benefited by the strike in South Wales, at slightly firmer prices. Ordinary rails are now quoted at £7, less 2½ per cent. There was, too, a temporary revival of inquiry for angles and plates, but it has not been maintained.

TRADES OF SHEFFIELD.

There has been very little change in the general state of trade during the week. Some of the rail mills are still producing a good tonnage, but it is known that in more than one instance operations are being carried on either at an actual loss or for prices which leave the merest shadow of profits.

No great amount of business is being transacted in merchant iron for general purposes, although several special brands of good Yorkshire iron still meet with a ready sale. Prices are weak, and may possibly come down as soon as the Staffordshire quarterly meetings have been held at the beginning of April.

Hematite pig irons are tolerably firm at figures varying very slightly from those given a week or two ago.

Sheet and several descriptions of tool steel are selling with greater freedom on home and American account, but common qualities are in little request, owing to the fact that they have been largely supplemented by Bessemer steels at much lower prices. During the week a lot of about 200 tons of Swedish iron bearing the brand "Steinbuck" has been offered for sale by public auction, but only a portion has been disposed of, the price being £21. 15/ per ton.

A petition for liquidation has been filed by D. & W. Lockwood, of Attercliffe, Sheffield, carrying on a steel and iron foundry business as Foster, Lockwood & Co., and in copartnership with Mr. J. Smith as Lockwood & Smith. The liabilities are estimated at £5500. A meeting of the creditors of Mr. W. De Lara Bright, iron agent, has also been held, the liabilities amounting to £3433, with assets valued at £200. Liquidation was resolved upon, and the debtor's discharge was granted. Several of the local "limited" iron and steel companies have again called their shareholders together, with tidings of an unfavorable nature. The Phœnix Bessemer Steel Company, Limited, has not paid its dividend for the year ending June 30th, last, and explains that there has been a great loss in the rail transactions. A meeting of the shareholders has, therefore, been held, at which a committee was appointed to confer with the directors as to their proposal to lessen the amount of £40 now paid up on each share, so as to increase the margin of uncalled up capital.

The shareholders in the New Sharlston Collieries, Limited, have also had a stormy meeting, the proceedings lasted five hours, and cannot very well be summarized succinctly here, but it may be stated that some of the old directors were re-elected, and that a proposal to hold the meetings at the collieries instead of in London was put but not clearly carried, owing to the confusion which prevailed. A special meeting of the Charlton Ironworks Company, Limited, was held at Sheffield last week in order to consider the position of the company and to discuss a scheme for raising £50,000 by issuing preference shares to bear 10 per cent. interest. The company was stated to be £1000 worse off than last year, its entire liabilities being £29,400, or, with £7100 due for last year's dividend, £36,500. Their property was, the chairman stated, worth £99,000, and was unencumbered; the monthly turnover was said to be about £7600. Some of the speakers advocated the raising of the money by debentures instead of preference shares, but the original proposition was carried by a very considerable majority. It was stated that more capital had been laid out than was originally contemplated, and that money was required as working trade capital.

On Monday, in accordance with an arrangement entered into a week previous, a delegate meeting from the various lodges representing the South Yorkshire Miners' Association was held at the central offices of that association at Barnsley. After a discussion relative to the state of trade, and the various advances in wages which had been conceded since 1871, an opinion was expressed that the men ought not to be called upon to submit to any present reduction of larger amount than 7½ per cent., in place of the 10 per cent. drop which the employers asked them to accede to. A deputation, consisting of several members of the council of the Miners' Association, were then appointed to proceed at once to Sheffield in order to confer with the owners. They therefore proceeded to the offices of the South Yorkshire and North Derbyshire Coal Owners' Association, where the finance committee, under the chairmanship of Mr. Markham, was awaiting their arrival. A discussion lasting about two hours took place, being conducted throughout in a friendly spirit, at the termination of which it was mutually agreed and resolved, "That a reduction of 10 per cent. from the advances given since October, 1871, is made from the second pay day in April next, and that no further alteration be made in the rate of wages for four months from that date." The question is thus again disposed of in an amicable manner. The men are certainly to be congratulated upon the good sense they have exhibited in avoiding a contest with the powerful organization of the employers, and they cannot fail to reap the reward of their compliance in many direct and indirect ways.

There is no animation whatever in the coal trade, the demand for ordinary steam and manufacturing fuel being on a limited scale, although the continuance of cold weather has had the effect of restraining the strong tendency of house coal toward lower prices. Ordinary manufacturing fuel is still about 5/ to 7/6 per ton, and best loco steam coal, 11/6 to 12/ at the pits. Now that a reduction in wages has been peaceably effected it is confidently anticipated that a considerable reduction in quotations will be declared by the local coal owners and coke producers.

As has just been stated, the house coal trade is tolerably steady, a fact which is further elicited by the returns showing the tonnage of coal carried to London by railway during the month of February. The Midland once more headed the list, the precise totals being as under: Midland, 145,144 tons; Great Northern, 83,316; London and North Western, 77,785; and Great Eastern, 66,954. These figures demonstrate that the Midland and North Western carried somewhat less than in January (the latter company by 5000 tons), but the Great Northern had an increase of nearly 3000, and the Great Eastern of not less than 19,000 tons. Eight of the largest South Yorkshire pits working the Barnsley thick coal sent 17,000 tons in February, as against 15,700 in January, and seven of the chief Silkstone collieries contributed 15,000 tons last month against 13,400 in January. The Midland, of course, had its largest tonnage from the Derbyshire pits, Clay Cross alone sending over 25,000 tons, and Langley Mill over 17,000 tons. The Great Northern line into the Derbyshire coal field will probably be ready for traffic in June next.

Some branches of the cutlery trades are experiencing a clearly better inquiry, particularly for certain common kinds of spring and pocket cutlery, which have long been neglected. These are mainly intended for the Levantine, West African and Indian markets. Spear and bowie knives are selling well for your Southern States and the Spanish West Indies. Ivory is again up a little in the market, and all kinds of haftings have an upward tendency.

BIRMINGHAM AND SOUTH STAFFORDSHIRE.

The near approach of quarter day is, as usual, being signalized by a diminution of orders from merchants and other buyers, whose requirements are not pressing. Still, however, the hardware trades are not lacking employment, many of the Birmingham and Wolverhampton factories having a satisfactory quota of favors on their lists. There is, for instance, a decidedly active inquiry for locks, edge tools, latches, wrought nails, brass foundry goods, nuts and bolts, navy brass work, bedsteads, sheep shears, japanned goods, enamelled goods, wrought and cast hollow ware, and tin plate goods. There is a steady demand, as is customary in the spring, for traveling trunks, toilet ware, and fancy goods for places on the sea coast. On the whole I may confidently remark that the Birmingham and district hardware industries are in a fairly satisfactory position. As much, however, can by no means be said of the iron trade. It is true that a few of the leading iron manufacturers are doing a fairly good business, but they are necessarily exceptions, the remainder, even of the leading firms, being unable to find their men more than three days' or four days' work per week. Many of the establishments are closed altogether, pending a revival of trade. There is, as heretofore, great discrepancy in prices, best bars being £11, and common £8. 15/.

THE SOUTH WALES DISTRICT.

The strike continues, with the most remote chances of coming to an end. The government poor law inspector has submitted certain questions to the association of employers, asking if they can give work to men out of employment at wages sufficient to keep them off the rates, and also asking to what extent the guardians can rely upon their aid. Mr. Halliday thinks the strike will last "until the masters come to reason," but a late telegram is to hand, stating that several employers are disposed to meet the government inspector's application by proposing that all works be thrown open at a reduction of 20 per cent. from the December rates. They declare that this further drop is necessitated by the great depression of trade. It yet remains to be seen whether the association, as a body, will assent to this proposition.

THE METAL MARKETS

have grown a little stronger during the week, and more sales have been effected, at the undernoted figures. The *Mining Journal* remarks: "*Copper.*—The market has been steady throughout the week, and holders have exhibited a determination to uphold prices; so that there has been no appreciable change in quotations from day to day. In the early part of the week there was but little demand, and g. o. b. Chili bars changed hands at £80, cash, and at the same price with three months' prompt. Wallaroo was quoted £90, cash; but at this price hardly any business was reported. As the week advanced rather more business took place, and sellers were found to be very firm at current quotations; indeed, it would have been difficult to have bought to any considerable extent except at advanced prices, which buyers were not disposed to give. Yesterday some important transactions took place in ores and regulus, 1250 tons of ore having been sold at 15/9, and 1550 tons of regulus at 16/3 per unit. The business in Chili bars was limited to best brands, £82; named brands, £80. 10; g. o. b., £80, all upon ordinary cash terms, and £80 for g. o. b., with three months' prompt. The demand for English varieties is very sluggish. Tough is quoted £86 to £87; best selected, £87 to £88; India sheets, 4 by 4, £93; and business has been done in yellow metal at 7⅝ for both sheets and sheathing. *Lead.*—The market has been very devoid of animation, and the quoted price of £21. 10/ for good soft English pig, and £21 and £21. 5/ for Spanish, does not appear to offer sufficient attraction to induce buyers to come forward. The advices from China are not encouraging to English shippers. *Spelter.*—The only transaction reported during the week is the sale of a parcel of Australian spelter at £20 per ton. *Quicksilver.*—Rumors are afloat that quicksilver has been found in considerable quantity and of good quality in Mexico, and upon the strength of these reports the market shows a sudden decline, the present quotation being £16 per flask. *Tin.*—The market, which closed very quiet at the end of last week, opened without the slightest sign of improvement, and on Monday a very limited business was done down to £84, cash, for Straits, and £86 for June delivery. On Tuesday afternoon, however, a marked and very sudden change came over the market, and a rise of £2. 10/ per ton in Straits was reported. Australian was in demand at £85, but sellers would not do business under £88. English ingot tin was quoted £93. On Wednesday the market was again firmer, business was more extended, and Straits realized £86. 10/ to £87. 10/. Australian was sold at £86, cash. Yesterday a large business was done in Straits, and upward of 300 tons are reported to have changed hands at prices similar to those of the previous day. An advance of £1 was reported in Australian, and £94. 10/ was quoted for English ingot tin. To-day Straits tin has been sold at £87. 10/. *Tin Plates.*—The market is fairly steady, without any important change."

Messrs. French & Smith say: "The metal market continues generally inanimate. In iron we shall have no steady trade until the disputes with the colliers are settled. Notwithstanding the diminution in production consequent on the strike and lock out, production is still in excess of demand. *Copper* quiet, but steady. *Tin* is well maintained, and a good business is doing, both spot and floating. *Tin Plates* easier. *Lead* dull. *Spelter* quiet. *Quicksilver* has been reduced to £16 per bottle."

At the Cornish ticketing, at Truro, on Thursday, 3367 tons copper ore realized £15,872. 16/, being an average of £4. 14/ per ton. Fine copper, 223 tons 1 cwt.; average produce, 6⅝; average standard, £112. 13/, being a decline of £6. 5/ on last sale.

Messrs. Harrington, Horan & Co.'s Liverpool report states: "We have had a gradually declining market since our last, and the following transactions in Chili copper have transpired: 2200 tons bars at £83 to £80 per ton; 36 tons ore here at 16/ and 1413 tons regulus to arrive here, at 16/3 per unit; 300 tons Californian ore, to arrive at Swansea, sold at 15/9 per unit. On the 5th, cablegrams from Valparaiso announced copper charters for the fortnight ending 2d inst., at 1500 tons in bars and ingots, including 100 tons for France. The news imparted a momentary firmness, which, however, was not maintained, and as we write the market has a drooping tendency, and we must reduce our quotations 50/ per ton as compared with prices current for bars on the 1st instant.

Latest Liverpool prices are:

Iron: f. o b in Liverpool, per ton.

	£ s. d.	£ s. d.
Merchant bar	8 15 0 @	9 0 0
Merchant bar, in Wales	8 5 0 @	8 10 0
Staffordshire	9 5 0 @	11 15 0
Hoop	10 10 0 @	11 10 0
Sheet	12 10 0 @	13 10 0
Nail rod	10 0 0 @	10 10 0
Bar, best crown	9 5 0 @	9 10 0
Boiler plates	12 0 0 @	13 5 0

Tin Plates: f. o. b. in Liverpool, per box.

	£ s. d.	£ s. d.
Charcoal, I. C	1 14 0 @	1 17 0
Coke, I. C	1 8 0 @	1 10 0

Copper: Delivered in Liverpool, per ton.

Bolt and Sheathing	£95 @	£96
Tile	88 @	00
Tough cake	90 @	00
Best selected	92 @	00

The War of the Railroads.

Judging from the present outlook there is to be an exciting railroad war between the Baltimore and Ohio, New York Central and Erie, Atlantic and Great Western and the Pennsylvania Railroad Companies. Most of the offices on Broadway, Tuesday, were besieged by applicants who were anxious to find out what reduction had been made in the rates to the West, so that they could avail themselves of the cheapest passage. Pedestrians were brought to a standstill by the attractive and sometimes amusing placards placed outside the office entrances. On one of these posters outside of the office of the Baltimore and Ohio Railroad Company, was the following:

"Horrible calamity! The combination on the ragged edge of despair! Their Quaker

guns fail to silence the columbiades of the Baltimore and Ohio! The Baltimore and Ohio King-Pin yet! Don't be fooled with the clap-trap of limited tickets!"

At another office of this company were other placards, bearing the inscription:

"Down with the Pennsylvania monopolies! The old reliable Baltimore and Ohio always ready with low fares!"

At the Erie and Pacific offices boards were placed on the sidewalk, bearing the words:

"Look here! See, we have got the Big Bonanza! You have refused arbitration; see the result!"

Outside the Grand Central and the New York and St. Denis hotels, similar attractions were to be found, having been placed there by Mr. Marsh, the ticket agent for those hotels. All the companies, however, did a good business.

It is expected that the fares will be even still further reduced unless some agreement shall be effected by the Baltimore and Ohio Company and those opposing it. The tickets of the Baltimore and Erie Companies appear to be more in demand, as they do not limit the purchaser to use them within a given time, nor are the passengers bound to make their journey complete on the start. Every effort will be made to gain a through competing line on the part of the Baltimore and Ohio Company. The following are the present rates of this company to the designated places, first-class tickets only being issued, and it is thought that the fare to Washington and Baltimore will be reduced also:

Chicago	$16·25
Cincinnati	16·25
Indianapolis	17·25
Louisville	18·25
Kansas City	32·25
Newark	15 25
Zanesville	15·25
Columbus	15·25
St. Louis	21·25

In order to beat this the Erie Company have fixed on the following sums for the same destinations:

	New Rates.	Old Rates.
Cincinnati	$15·00	$30·00
Chicago	18·00	22·00
St. Louis	21·00	27·00
Columbus	14·50	17·50
Indianapolis	16·00	21 00
Kansas City	31·00	38·00
Omaha	31 00	38·00
Louisville	18·00	24·00

These tickets are limited to five days after issue. The tickets sold to any of the above places can be purchased for $1 less than those sold at the companies' offices, the passengers being sent over the Pennsylvania road. Most of the ticket offices, excepting the Baltimore & Ohio, have adopted these rates, and until some further change is ordered by the companies. The following rates have been agreed to from Chicago to New York, which are to be good only for three days:

Chicago to New York	$15·00
To Boston	19·00
To Buffalo	12·00
To Philadelphia	12·00

And to Baltimore and Washington, $9, good for the same period.

The rates prior to this time were:

To New York	$22·50
To Boston	25·85
To Philadelphia	20·00
To Baltimore and Washington	19·00

There are no other drawbacks to the use of these tickets except that they must be used within the time specified. This limit is fixed so as to protect the local traffic of the roads.

The following are the rates now adopted from Quincy, Ill., to New York—$20—good for five days:

To Boston	$24·00
To Buffalo	17·00
To Toledo	12·00
To Cleveland	14·00
And from St. Louis to New York	18·00
To Boston	22·00
To Buffalo	16·00
To Cleveland	13·00
To Toledo	11·00
And to Detroit	12·65

Tickets West from Buffalo are now sold as follows:

By the Lake Shore road, to Toledo, $5, and to Chicago, $11; by the Canada Southern Railroad to Toledo or Detroit, $5. The Great Western and Michigan Central are maintaining their full rates, namely $7 to Detroit, and Chicago, $14. It is impossible to say when the fight will be over.

Safety Lamps.

A new form of safety lamp has been patented by Mr. M. I. Landau, in England. The top and bottom of this lamp are connected with each other with a bayonet joint, and it has a peculiar arrangement for admitting the air to support combustion. The portion of the lamp which is usually the oil chamber is a mere casing, with double cylindrical sides, the inner cylinder having orifices covered with wire gauze. The air enters through wire gauze at the top of the annular chamber formed by the two cylinders, passes downward, then through the gauze-covered orifices in the inner chamber to the interior of the lamp. The lamp itself is about two-thirds the diameter of the casing, is fastened to the casing by a bayonet joint, and carries a simple fall-down extinguisher arrangement. The lamp has neither lock nor key, but on the inner side of the inner cylinder of the casing there is a projection which, upon any attempt being made to open the lamp releases the fall-down extinguisher, so that the lamp cannot be opened until the flame has been extinguished. It is stated that this lamp is made to remedy all the defects of the Davy lamp; the atmospheric air which supports the flame passes through an air chamber of a peculiar construction, so made that the air has to descend and circulate and ascend to reach the flame, therefore the velocity which might be outside the lamp will lose its strength when it reaches the flame. The upper part of the lamp is so constructed as only to allow the gaseous products to escape, and the entry of the gas or air from the outside of the upper part of the lamp is prevented, no air being drawn in at that part to feed the flame, and even if there might be a very great velocity it will never force the flame through the upper part so as to ignite the gas outside, moreover it will never affect the flame. It is especially claimed, moreover, that the lamp is so constructed that no screwing and no locking are required, it is simply united by a bayonet joint, and when an attempt is made to detach the upper part the flame is instantly extinguished before the two parts of the lamp are separated. It is intended to get the lamp thoroughly tested in a colliery, and it will be gratifying to learn that the opinion of practical and scientific men upon it establish its claim to great efficiency and simplicity.

The Government and the Centennial.—The Interior Department is making preparations for a thoroughly organized exhibition of its different branches at Philadelphia in 1876. The chief feature will probably be that of the Indian Bureau. Instructions have been sent out to the Indian agents to collect and send in all materials which they can find to illustrate Indian life and history. It is proposed to have a tribe of semi-civilized Indians on the grounds of the exhibition, where their home, life and habits will be accurately represented. The permanent portion of this branch of the exhibition will be transferred to the Smithsonian Institute at the close of the exhibition. The Patent Office will make an extensive exhibition, which it can easily do. The Bureau of Education is taking the lead in organizing a complete exhibition of the school life and science of the country. This it hopes to make very elaborate. A meeting of gentlemen interested in the subject of education is to be held, under the auspices of the bureau, in Philadelphia next week to advance the work of organization for 1876.

An Extraordinary Scale.—The 123 feet railroad track scale, built at Packerton (one mile south of Mauch Chunk), in June, 1872, by Messrs. Fairbanks, for the Lehigh Valley Railroad Company, has done more weighing for the same time than any other scale in the world. Its average weighing per day is over 20,000 tons for every day in the year, an annual tonnage of over 7,000,000 tons. A single day's (24 hours) weighing has often exceeded 60,000 tons. The scale has been subjected monthly to the severe "Goodwin test," and has always been found correct. Although over 18,000,000 tons have been weighed upon the scale, it has never yet required repairs.—*Mauch Chunk Coal Gazette*, March 12th, 1875.

London Metal Market.

(From The Mining Journal.)

	£.	s.	d.	£.	s.	d.
Copper—₸ ton.						
Best Selected	93	0	0		—	
Tough Cake & Tile	88	0	0		—	
Sheathing and Sheets	92	0	0		—	
Bolts	93	0	0	96	0	0
Bottoms	93	0	0	95	0	0
Old	85	0	0		—	
Australian, Wallaroo	90	0	0		—	
" other brands	88	0	0	89	0	0
Chili bars, g. o. b.	80	0	0	82	10	0
Wire	₸ lb.	0	1	0	—	
Tubes	"	0	1	¼	—	
Brass—₸ lb.						
Sheets		0	0	9¼	0	0
Wire		0	0	9¾	0	0
Tubes		0	0	12	0	0
Yellow Metal Sheathing		0	0	7¾	0	0
Sheets		0	0	7¾	0	0
Spelter—₸ ton.						
Foreign on the spot	23	7	6	0	0	0
" to arrive	23	10				
Zinc—₸ ton.						
In Sheets	30	15	0		0	0
Quicksilver—₸ bottle.	16	0	0			
Tin—₸ ton.						
English Blocks	93	0	0	94	0	0
Ditto Bars (in bris.)	94	0	0	95	0	0
Ditto Refined	96	0	0		—	
Banca	95	0	0		—	
Straits	87	10	0		—	
Australian	85	0	0	87	0	0
Tin Plates—† ₸ box.						
IC Charcoal	1 qual.	1	15	0		
IX "	1 qual.	2	4	0		
IC "	2 qual.	1	16	0	1	17 0
IX "	2 qual.	2	2	0	2	3 0
IC Coke		1	6	6	1	7 6
IX "		2	12	6	1	13 6
Canada Plates	₸ ton.	18	10	0	19	0 0
" at works		18	0	0	18	10 0
Iron—₸ ton.						
Bars Welsh, in London		8	15	0		—
" to arrive		8	12	6	8	15 0
Nail Rods		9	5	0		—
Nail Rods, Staff'd in L'don		10	0	0		—
Bars		10	0	0	11	0 0
Hoops		11	0	0	12	0 0
Bars at Works		9	0	0	11	0 0
Hoops ditto		10	0	0	11	10 0
Sheets, angle, and plates		12	0	0	14	10 0
Pig, No. 1, in Wales		5	0	0	6	10 0
Refined metal ditto		7	0	0	8	0 0
Bars, common ditto		7	15	0	8	0 0
Do, merchant, Tyne or Tees		8	0	0	9	10 0
Ditto, Railway, in Wales		6	15	0	7	0 0
Ditto, Swedish, in London		16	0	0	17	5 0
To arrive		17	5	0		—
Pig, No. 1, in Cirde		5	15	0	5	12 6
Ditto, f.o.b., Tyne or Tees		4	0	0	4	5 0
Ditto, Nos. 3, 4, f.o.b.		8	10	0	4	0 0
Railway Chairs		5	0	0	5	5 0
" Spikes		12	10	0	14	0 0
Indian Ch'coal Pigs in L'don		8	0	0	10	0 0
Steel—₸ ton.						
Swedish, in kegs (rolled)						—
Ditto (hammered)		19	0	0	20	0 0
Ditto, in faggots		20	10	0		
English, spring		19	0	0	24	0 0
Lead—₸ ton						
English Pig, common		21	15	0		—
Ditto, L.B.		22	5	0		—
Ditto, W.B.		23	0	0		
Ditto, Sheet		25	15	0		
Ditto, Red Lead		24	5	0		
Ditto, White		30	0	0	32	0 0
Ditto, Patent Shot		25	5	0		—
Spanish		21	0	0	21	10 0

* At the works, 1s. to 1s. 6d. per ton less. Terne plates 2s. per box below tin plates of similar brands.
† Add 1s. for each £.

STANDARD
32 Cal.
Just Out.

Prices Reduced for Little Joker, STANDARD, Paragon, Tycoon & Whitney's Revolvers.

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HERCULES IRON CUTTER.

No. 1, weight	16 lbs.,	cuts	¾x2	inch, or	½	inch round or square	Price	$25·00
No. 2, "	165	"	⅝x3	"	⅝	" "	"	50·00
No. 3, "	350	"	¾x4	"	1	" "	"	75·00

This is by far the most powerful Iron Cutter in use which can be worked by hand, having three times the capacity of any other machine which sells at the same price. The No. 3 machine occupies a space of 12x30 inches; when in use additional space must be had for the lever to work in. We send two sets of knives with each machine—one for square and flat, the other for round iron and steel. By using the knives adapted to it, round iron is cut without being flattened. One man can cut the largest size iron named above, but two would be required for steady work. It does not take a minute to change the knives or to shift the machine from large to small sizes.

AUGUSTA, GA., March 3, 1875.

MILLERS FALLS CO.—Enclosed find draft for amount of invoice, January 7. We would have sent the amount before, but did not have an opportunity of trying the Iron Cutter until a few days ago. It is one of the best machines we ever saw. Yours, truly, MOORE & CO.

Office of the ATHENS FOUNDRY AND MACHINE WORKS,
ATHENS, GA., February 18, 1875.

H. L. PRATT, President.—Dear Sir: Enclosed find draft made payable to your order by Messrs. Childs, Nickerson & Co., in payment for Iron Cutter. We have put our Cutter to good service, and find it cuts readily 1¼ round, and 3½ x ⅝ square iron. C., N. & Co. are pleased with theirs, say it will save many a blow and cold chisel in their iron house.

Truly, yours, R. NICKERSON, Agent.

We make a satisfactory discount to dealers, and warrant the cutters to do all which we claim for them. Send for prices.

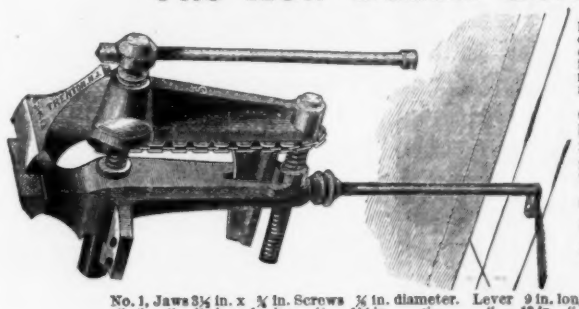
Millers Falls Company,

No. 78 Beekman Street, New York,

Sole Proprietors and Manufacturers of the

Barber Self-Fitting Bit Braces, Millers Falls Vises,
Improved Angular and Ratchet Drilling Machines,
TUBE SCRAPERS, FAMILY TOOL CHESTS,
Patent Adjustable Tool Holders, Mitre Boxes, Ratchet Braces, Breast Drills, etc.

The New Double Screw Parallel "Leg" Vise.



We are now ready to furnish, as the result of more than thirty years' experience, our latest style of Vise—the best yet made. It is **stronger** than any other, whether of Foreign or of American make; always parallel and holding with a tighter "grip." The jaws are of convenient shape for the workman to get near his work equally well for filing or chipping, instead of the heavy, clumsily formed jaws of the cast iron Single Screw Vises of the common "parallel" type, and which, depending upon slides alone for preserving parallelism, can never be screwed up very hard without "jamming" on the sides or breaking.

Our New Vise combines all the advantages of the "Peter Wright" Leg Vise, of strength and lightness, fastening to the floor and bench, and at the same time greatly superior to it; is always perfectly parallel at all points of opening, and never gets out of line. Embodying the same general principle as the well known Chain Vise, so long made by us, we have by new, scientific proportioning of all the parts, and with our recently improved metals for their manufacture, obtained so perfect a tool, that we now *warrant* these Vises for *three years* from date of manufacture stamped upon each.

The Jaws are of best Tool Cast Steel, welded on, file cut and properly hardened. The screws are forged of the best refined iron, and work in *solid cut thread* boxes.

The lower screw maintains the parallel position of the two jaws, by having exact motion with the upper working screw through the connecting chain which regulates it.

The chain is very accurately made of steeled links and rivets, and having no strain of the work upon it, is therefore as durable as all the other parts.

Prices with Special Discounts to the Trade.

No. 1, Jaws	3¼ in. x	¾ in.	Screws	¾ in.	diameter.	Lever 9 in. long,	Opens 4¼ in. $8 00
" 2, "	4½ in. x 1	in.	"	1⅛ in.	"	" 13 in. "	" 5¼ in. 12 00
" 3, "	5¾ in. x 1¾	in.	"	1¼ in.	"	" 16 in. "	" 6⅜ in. 17 00
" 4, "	6¾ in. x 1¾	in.	"	1⅜ in.	"	" 19 in. "	" 7¾ in. 22 00
" 5, "	7 in. x 1¾	in.	"	1⅜ in.	"	" 24 in. "	" 9 in. 30 00
" 6, "	8 in. x 1¾	in.	"	1⅜ in.	"	" 28 in. "	" 10 in. 34 00

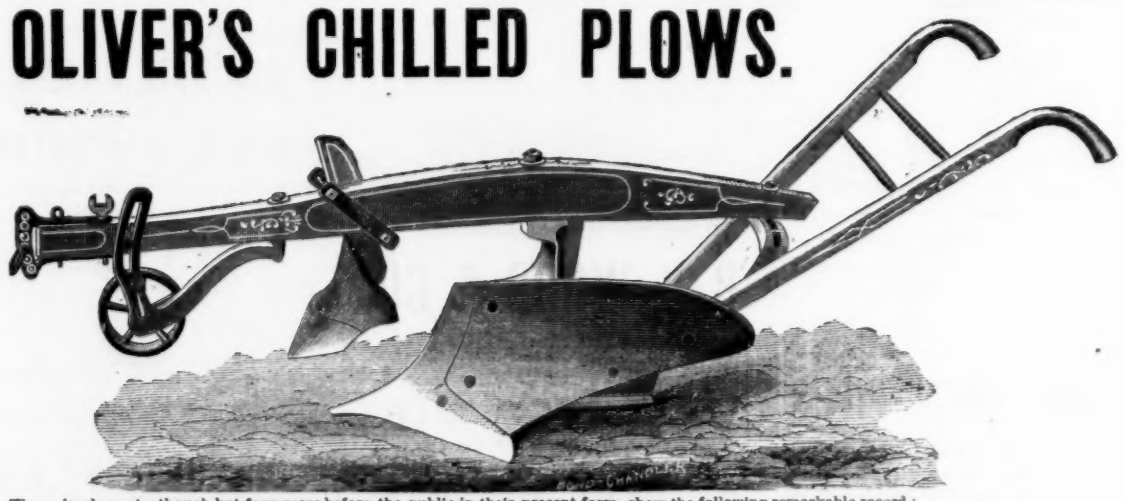
All sizes of these Vises furnished with Swivel Attachment, at an additional cost of $1 to $3. Sold at the General Agencies.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trade).

New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—Messrs. HORACE DURRIE & CO. Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE.

FISHER & NORRIS, Trenton, N. J.

OLIVER'S CHILLED PLOWS.



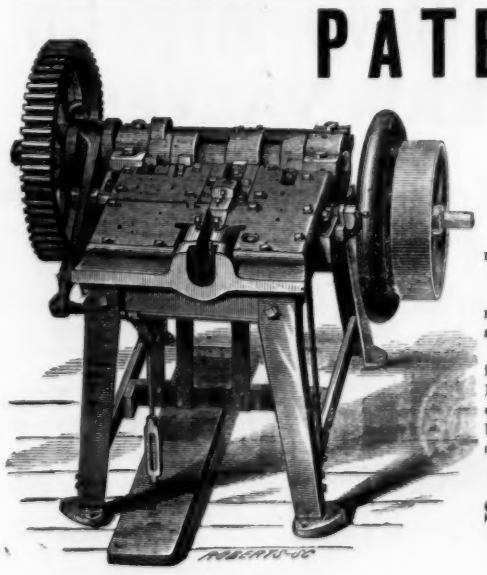
These implements, though but four years before the public in their present form, show the following remarkable record:

1506 were sold in the season of **1871.** **7472** were sold in the season of **1873.** **30,000** will be made for the season of **1875.**
3049 " " " **1872.** **14,976** " " " **1874.**

For full descriptive circulars, address,

SOUTH BEND IRON WORKS, South Bend, Ind.

PATENT BOLT HEADER



Manufactured by

WILLIAM GARDNER'S SONS,
575 Grand Street, N. Y.

Having invcstigated the comparative merits of this and all other machines, we can recommend it as the Best Bolt Header ever made.

It will commend itself for simplicity, durability, quality and quantity of work over all others.

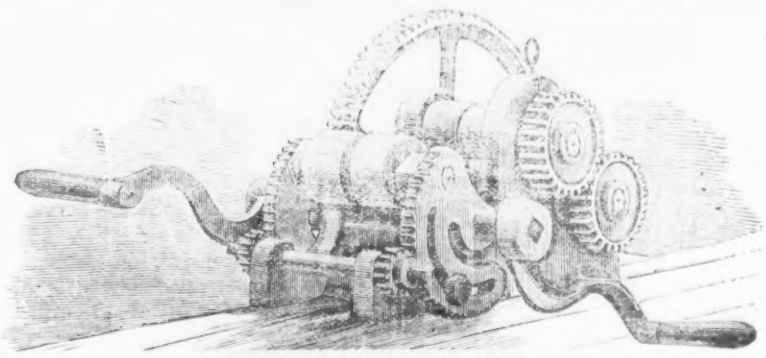
It will make perfect Square or Hexagon Bolts, in from 3 to 5 revolutions, and runs at the rate of one hundred and twenty revolutions per minute. Plough, Track, Button-head Bolts, and all similar heads are made with one revolution.

To show that it will stand the test of long continued strain, it has made eleven tons of half-inch Bolts from one-and-one-quarter to two-and-one-half inches long; eighteen tons five-eighth Bolts; twenty-six tons three-quarter Bolts, and thirty-seven tons seven-eighth Bolts, by one set of dies for each size, without change or repairs. It makes and cuts off the bolt from the heated bar, from one to ten inches, or of any greater length cut for the purpose, and either round or square Iron may be used.

ANY STYLE OF HEAD CAN BE MADE, INCLUDING
Square, Hexagon, T, Button, Countersunk, Cone, Plough and Track Bolts, &c., &c.

Guy C. Hotchkiss, Field & Co.,

85 First St., Brooklyn, E. D., and New York City.



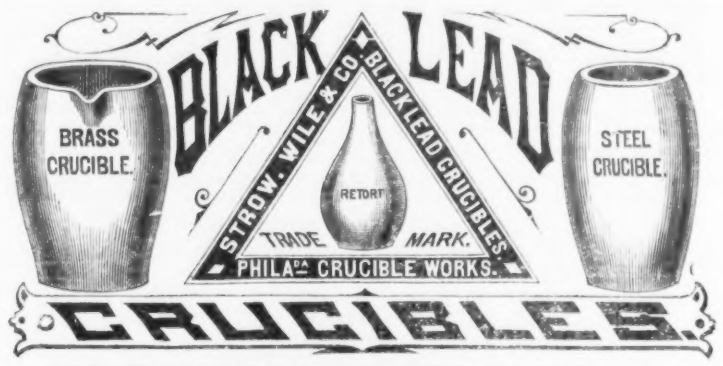
Patented January 13, 1874.

This Machine is destined to supersede all Tire Benders now in use, especially for heavy work. The middle roller can be readily removed and readjusted, thus allowing Tires to be withdrawn without difficulty after being bent. Fifth Wheels and Tires never slip while being bent in this Machine. One man can bend a Tire 3x1 without difficulty.

Manufacture Carriage Materials, Axles, Springs, Blacksmiths' Supplies, Bolts, Wood Work, Trimmings, &c.

IMPORTERS AND DEALERS IN

IRON AND STEEL.



FOR MELTING ALL KINDS OF METALS,

And Manufacturers of

Sunny Side Stove Polish.

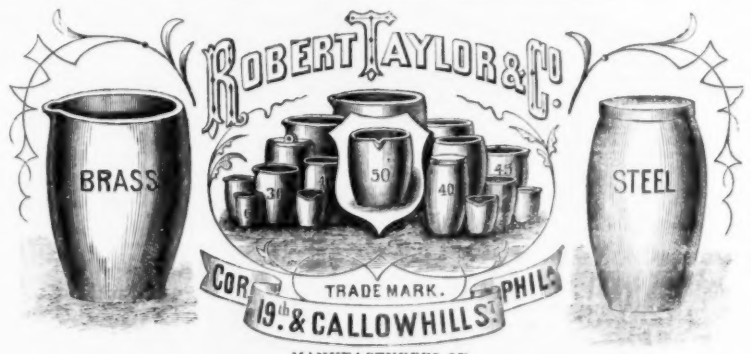
Lumber Pencils, Foundry Facings and Lubricating Plumbago.

STROW, WILE & CO.,

Nos. 1324, 1326, 1328, 1330, 1332 & 1334 Callowhill St., Phila.

GENERAL AGENTS:

Messrs. HALL & CARPENTER, 709 Market St., Phila.



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BLACK LEAD CRUCIBLES

Of all Sizes and Forms for melting

Steel, Brass, Gold, Nickel and all kinds of Metals.

Mr. Robert Taylor, who was for seven years the head of the late firm of Taylor, Strow & Co., and who is a practical mechanic, and familiar with all the details of the manufacture of Crucibles, attends personally to our manufacturing department. We would, therefore, respectfully solicit a continuance of the favors hitherto extended to him.

ROBERT TAYLOR & CO.,

No. 1900, 1902, 1904 & 1906 Callowhill, St., Philadelphia.

General Agents. { MERCHANT & CO., 507 Market Street, Philadelphia.
PARK & CO., 122 Second Avenue, Pittsburgh, Pa.

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Corner 16th & Buttonwood Streets,
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CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETE.

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

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Thomas T. Tasker, Jr. Stephen P. M. Tasker

MORRIS, TASKER & CO.,

PASCAL IRON WORKS, Philadelphia,

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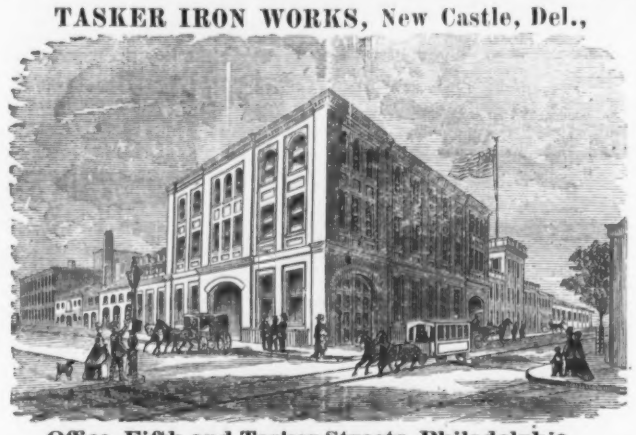

Office, Fifth and Tasker Streets, Philadelphia.

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Plain, Galvanized and *Rubber-Coated*, for Gas, Steam and Water.

Lap-Welded Charcoal Iron Boiler Tubes.

Oil Well Tubing and Casing, Gas and Steam Fittings, Brass and Steam Fitters' Tools, Cast Iron Gas and Water Pipe, Street Lamp Posts and Lanterns, Improved Coal-Gas Apparatus, Etc.

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Thirty different styles in IRON AND WOOD. 80,000 ALREADY IN USE.

Smooth Planes,
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Jointer Planes,
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Carpenters,
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Car Builders,
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Millwrights,
Wheelwrights,
All Use them

Manufactured by the **STANLEY RULE & LEVEL CO.,**

Factories: New Britain, Conn. Warerooms: 35 Chambers Street, New York.

TRADE MARK

PAGE'S PATENT MAY. 8. 1866.

HOUSE ESTABLISHED, 1862.

GEORGE S. FALES,

SUCCESSOR TO

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Sole Owner and Manufacturer of

Page's Patent Lace Leather,

And Manufacturer of

OAK BELTING,

Also, Picker or Moccasin Leather, for Boot and Shoe Packs.

Angular Belting and Pullies made to order.

PAWTUCKET, R. I.

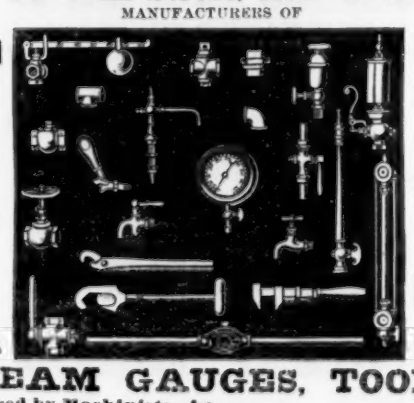
Ask for Star Stamped Lace Leather.

EATON, COLE & BURNHAM CO.,

58 John Street, New York.

MANUFACTURERS OF

Wrought Iron **PIPE,** Cast Iron FLANGED PIPE, Cast Iron RADIATORS and BOILERS.



Brass & Iron **STEAM** Gas & Water FITTINGS. PLUMBERS' MATERIALS.

STEAM GAUGES, TOOLS,

And all Supplies used by Machinists, &c.

New Patent "X" Razor Strap.

PATENTED DECEMBER 23, 1873.

This Strap, designated on our List as Letter "X," is of novel construction—is elastic, pleasantly yielding to the razor—gives a keen fine edge—is made of superior stock—is furnished at a low price—**and gives universal satisfaction.**

ITS PRICE SELLS IT.

BENJAMIN F. BADGER, Sole Manufacturer,

Badger Place, Charlestown, Mass.

Pipe, Fittings, &c.

National Tube Works Co.,

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MANUFACTURERS OF

Best Quality Lap Welded Iron Boiler Tubes,

STEAM AND GAS PIPE,

Artesian Oil and Salt Well Tubing and Casing,

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For STEAM, WATER and GAS.

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Illustrated Catalogue sent by express to the Trade on application.

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FOR HIGH & LOW PRESSURE STEAM HEATING APPARATUS FOR ALL CLASSES OF BUILDINGS.

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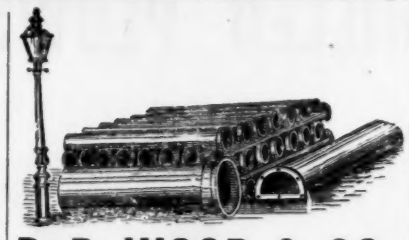

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Manufacturers of

Cast Iron Pipe

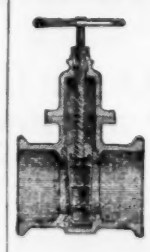
FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

Chapman Valve Mfg. Co.,



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Iron and Composition, of all sizes.

WATER and GAS Gates, 3 to 48 inches

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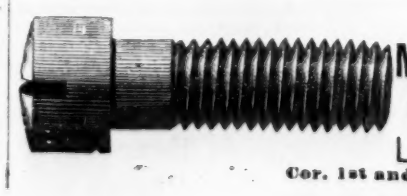
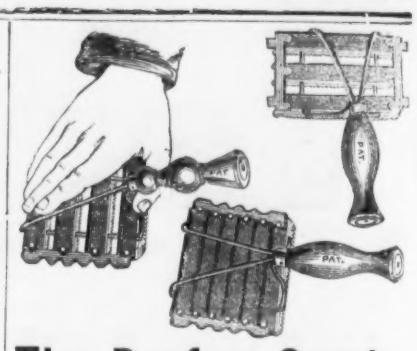


TURNED MACHINE SCREWS,

One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

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Successors to

MACKRELL & RICHARDSON MFG. COMPANY

Manufacturers of

Builders' Hardware,

Locks, Hinges, Hooks and Staples,
Awning Hooks, Meat Hooks, Pincers,
Champion Noiseless Pulleys,
CHAIN PULLEYS &c.

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Warehouse, 73 Warren St., N. Y.

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Patent Water Closets,

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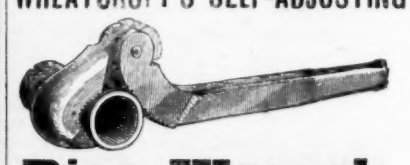
168 Fulton Street, N. Y.,

Proprietors and Manufacturers of

WHEATCROFT'S SELF-ADJUSTING



Pipe Wrench,

AND

Scripture's Funnel Top

MACHINE OILERS.

Dealers in

STEAM AND GAS FITTERS TOOLS.

DRILLS,

Pipe Tongs,
Pipe Cutters,
Pipe Threaders,
Flue Brushes.

M. D. CONVERSE & CO.,

68 Park Place, N. Y.

The Iron Age Directory

and index to Advertisements.

Art Education for Mechanics.

The Pittsburgh *Commercial* says:

The idea of making education more practical seems to have at last reached those who have charge of our public schools, and good results are likely to follow. Attention has been directed to the primary departments, and it is conceded that the best teachers should be furnished to the younger pupils, and every facility afforded for their advancement. The ornamental part of an education is well enough for those who have sufficient time to pursue it, but the majority of scholars are thrown out into life to begin their work at the age of fourteen. Whatever education they are to acquire at the public expense, must be gained before that time, and as they are to be self-dependent, it must be conceded that it should be as practical as is possible. There is a demand in the country for skilled labor, but there is no call for business and professional men, nor yet for those who are ready to take "anything not menial," meaning any occupation that does not call for the labor of their hands. It was far better that the boy who has his own way to make in life should have a trade at his back, than be content with merely an ornamental education. His skill in labor will not prevent his making a fortune in business, or following out any other calling. And he has the advantage of being able at any time to fall back upon his trade, of which no reverse can deprive him. The mechanic and his trade, once united, are forever inseparable, and industry with skill is the sure road to prosperity. But the progress of our manufacturing industries demands the highest type of skilled labor, for which we have hitherto looked largely to European countries. If we would create it in our midst, we need art schools and technological colleges. Help along the drawing in our public schools.

Inprovement in Wood-working Machinery.—Mr. Fernando de Albuquerque, of the province of San Paulo, Brazil, and now a student in the Civil Engineering Department of Lafayette College, is the inventor of a machine now being patented in his native country, designed to facilitate the cutting of a peculiar wood indigenous to Brazil. He has also recently completed a design of an entirely different sort, which is now ready for patent. It is an improvement of the instrument used by engineers known as the plane table. The improvement consists of the addition of two adjustments: the first enables the drawing plate or table of the instrument to be set more readily than heretofore over the point of observation, and this without interfering with the previous leveling of the table, as the table can be moved several inches without moving the tripod. The second is an arm attached to an alidade of new form, by the use of which, the point to be viewed is indicated in a manner easier than the old practice of finding the intersection of two lines: thus the sheet on which the sketch is made is not confused with so many lines as formerly, and the work is accomplished with more accuracy, and in half the time. Mr. Albuquerque's invention has been examined and commended by Professors in Lafayette College.

Unseaworthy Ships.—The way in which a certain portion of the English public have encouraged the opposition of interested parties to Mr. Plimsoll's philanthropic efforts may bring its own punishment by deterring those who might otherwise be inclined to attempt the removal of kindred evils. One of the charges brought against the benevolent, and, luckily for an important class, the equally resolute, member for Derby, was that he had grossly exaggerated the state, as regards danger, of our mercantile marine, and the most was made of a few cases of over or misstatement easily accounted for. That there was no exaggeration in the main is rendered absolutely certain by a return just presented to Parliament, from which we learn that between the 5th August, 1873, and 31st December, 1874, 440 vessels were reported to the Board of Trade as being defective in hull, equipment, or machinery. Upon survey 404 were found to be unseaworthy and 14 seaworthy; while in 22 cases the survey was pending on the date last named. Of these 440 vessels 25 were dismantled or broken up after survey. During the same period 34 vessels were reported as overladen or improperly laden, and in each case the complaint was found to be well founded. These 34 vessels were lightened or reloaded to the satisfaction of Board of Trade surveyors, and in no instance in which the act has been put in force has the allegation of overloading or improper loading been found to be groundless.

Russian Manufacture.—The Technical Society, of St. Petersburg, which enjoys the patronage of the Russian government, reviews the condition of the machine making and engineering works in that empire, and deplores the want of Russian co-operation in these trades. A commission which it lately appointed to investigate the subject has now reported that most of the works are possessed by foreigners, who own, for instance, in the St. Petersburg district 28 out of the 35 works; 22 out of 47 in the province of Moscow; 6 out of 14 in the Vistula districts, and 21 in the whole of the Baltic provinces. The report further states that exclusive of the Imperial Works there are 167 machine works in Russia; about three-quarters of these establishments turn out locomotive and general railway plant, whereas the remaining quarter construct agricultural implements and other machines. The majority of these works lie in Poland, after which the Baltic provinces figure next in number, and the rest of these establishments are situated in the central and southern provinces of the empire. In the before mentioned works there are 422 engines and 476 boilers, of 6162 horse-power, and the total number of workmen employed is 41,382, of whom more than half can neither read nor write! The annual consumption of these works is given as 133,500 tons of pig iron, 164,895 tons of wrought iron, and 127,000 tons of fuel, including about 100,000 tons of coal and coke.

HENRY DISSTON & SONS,

Keystone Saw, Tool, Steel and File Works,

Front and Laurel Streets, Philadelphia.

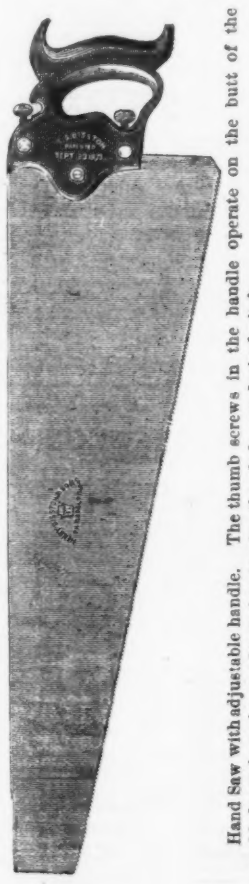
Branch Works, Tacony, Philadelphia. **Branch House, Randolph & Market Streets, Chicago, Ill.**

MANUFACTURERS OF

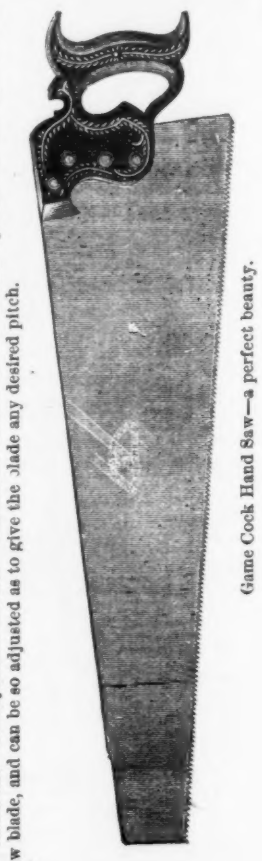
SHEET STEEL, and all Articles made from Sheet Steel.

SAWS OF EVERY DESCRIPTION.

Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.



Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.



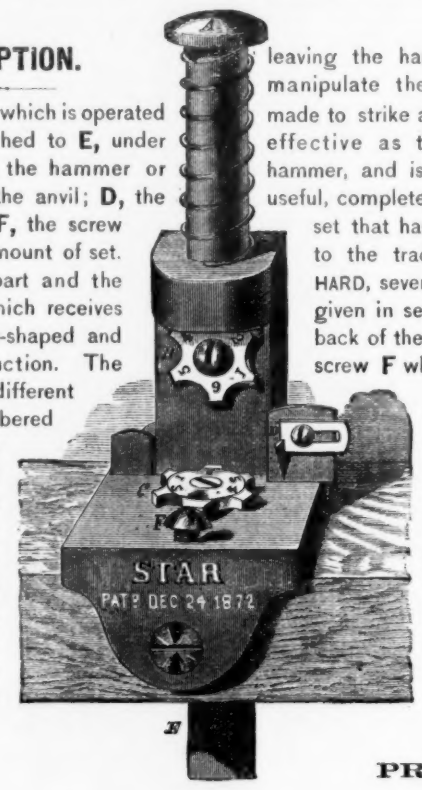
Game Cock Hand Saw—a perfect beauty.

HENRY DISSTON & SONS' PATENT STAR SAW SET.

DESCRIPTION.

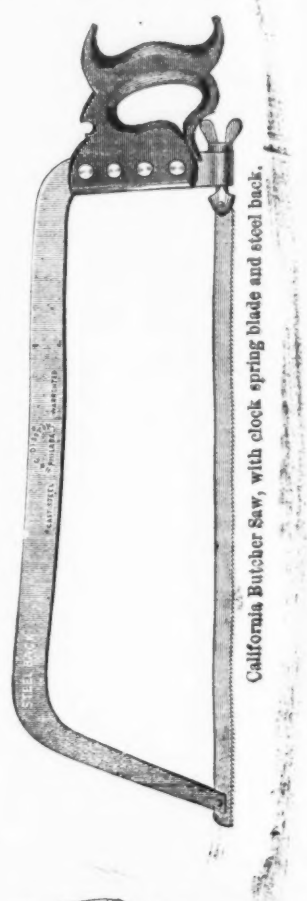
A is the plunger, which is operated by a treadle attached to **E**, under the machine; **B**, the hammer or striking part; **C**, the anvil; **D**, the movable gauge; **F**, the screw to regulate the amount of set.

The striking part and the anvil, or portion which receives the blow, are star-shaped and similar in construction. The points are all of different sizes, and are numbered from **1** to **6**, and are designed to set different size teeth. Prominent among its advantages is the fact that it can be operated wholly by the foot by means of a treadle, thus leaving the hands to guide and manipulate the saw. It can be made to strike a blow as sharp and effective as though done by a hammer, and is at once the most useful, complete, and effective saw set that has ever been offered to the trade. If the saw is HARD, several blows should be given in setting it. Raise the back of the saw from the guide screw **F** when the first blow is given, and gradually lower it with each blow until the process is complete. Thus many a good saw will be saved from utter ruin. A trial will suffice. Be sure to clean the saw teeth before setting.

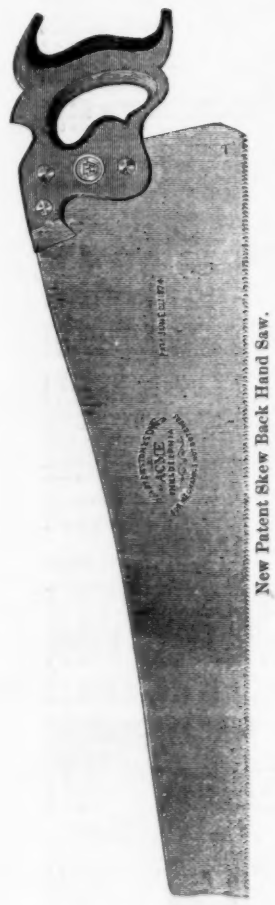


PRICE, $1.50.

A cheap Saw, fully guaranteed. Six tools in one. Adapted to farmers' or plantation use. A Rip and Cross-Cut Saw, Square, Rule, Straight Edge and Scratch Awl combined.

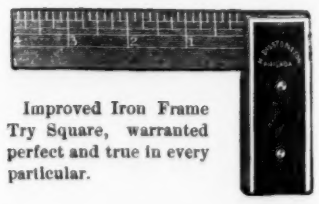


California Butcher Saw, with clock spring blade and steel back.



New Patent Skew Back Hand Saw.

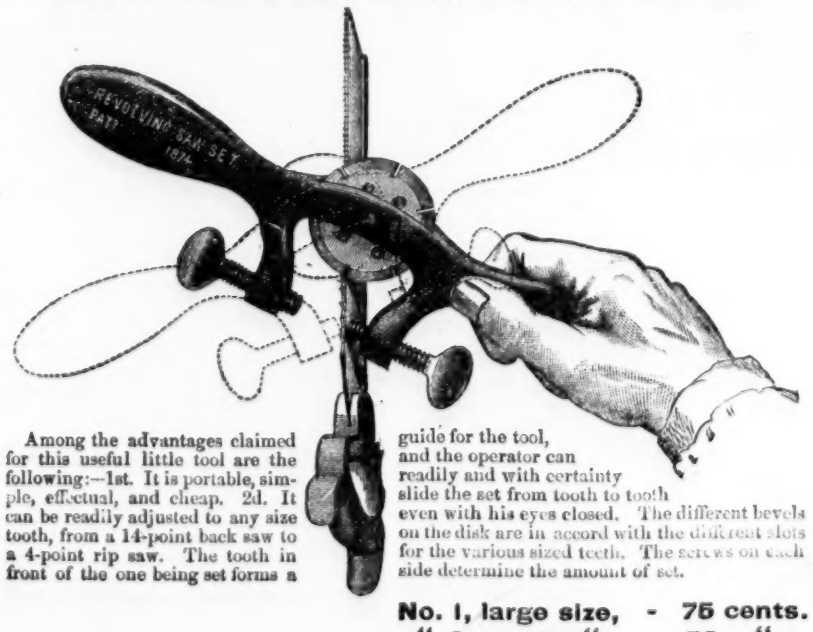
New Patent Skew Back Hand Saw.



Improved Iron Frame Try Square, warranted perfect and true in every particular.

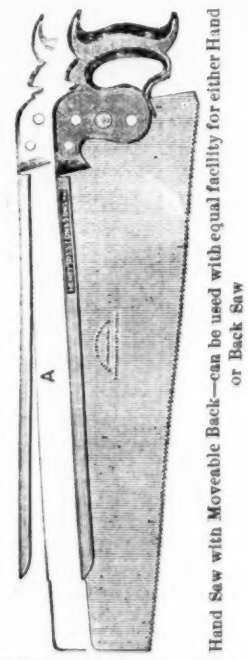
Patent Adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.

HENRY DISSTON & SONS' PATENT REVOLVING SAW SET.



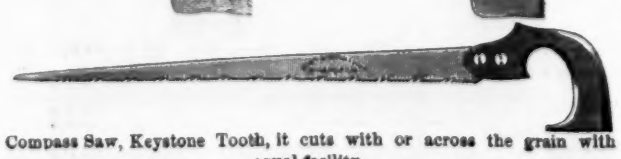
Among the advantages claimed for this useful little tool are the following:—1st. It is portable, simple, effectual, and cheap. 2d. It can be readily adjusted to any size tooth, from a 14-point back saw to a 4-point rip saw. The tooth in front of the one being set forms a guide for the tool, and the operator can readily and with certainty slide the set from tooth to tooth even with his eyes closed. The different bevels on the disk are in accord with the different slots for the various sized teeth. The screws on each side determine the amount of set.

No. 1, large size, - 75 cents.
" 2, small " - 50 "



Hand Saw with Moveable Back—can be used with equal facility for either Hand or Back Saw

Improved Pruning Saw and Knife, Patented August 29, 1873.



Compass Saw, Keystone Tooth, it cuts with or across the grain with equal facility.

Hack Saw. The blade in this saw is reversible, an advantage which will be readily appreciated by mechanics.

New York Wholesale Prices, April 7, 1875.

HARDWARE.

Anvils.
Solid Cast Steel ℘ ℔ 14c
Wright's ℘ ℔ gold 11c; over 250 ℔s 11½c, gold
Armitage's Mouse Hole gold 11c
Wilkinson's ℘ ℔ gold 11c
Eagle Anvils ℘ ℔ 8c

Apple Parers.
Domestic, Turn Table, Lightning, Hudson's, Reading, Union } $7.75 ℘ doz
Skeleton Paring, Coring and Slicing
Bay State, Paring, Coring and Slicing $15 00 dis 10 %
Climax Slicer 8 00

Augers and Bits.
Douglass, Ives, Beecher (French, Swift & Co), Griswold, Noble } 1st quality..dis 40 @ 40&10 %
Challenge dis 40&10 %
Snell Mfg. Co. dis 22½ @ 25 %
Russell Jennings dis 10 %
Lewis' Single Twist Bits dis 30 %
Andrews' Bits dis 25 %
Cook's Bits dis 40&10 %
" Augers dis 50 %
Expansive Bits, Clark's....small, $18; large, $26—dis 15 %
" " Ives' $20 @ $30—dis 30 %
" " Blake's $30—dis 25&10&10 %
Hollow Augers, Douglass', Ives' } dis 40 %
" " French, Swift & Co.
" " Bonney's Adjustable, ℘ doz $48—dis 25 %
" " Stearns' " ℘ doz $48—dis 25 %
" " Ives' Expansive each $4·50—dis 40 %
" " Cushman's Expansive dis 20 %
Gimlet Bits—Screw, $7·00; no screw, $9 dis 20&10 %
Double Cut Gimlet Bits, Shepardson's dis 20 %
" " " Hartwell's dis 50 %
" " " Douglass' dis 30 %
" " " Ives' dis 25 %
" " " Ladd's dis 50&10 %
Griswold's Patent dis 20 %
Morse's Bit Stock Drills dis 20 %
L'Hommedieu's Ship Augers dis 15 %
Watrous Ship Augers dis 15 %
Vaughan's Post Hole—
6 in. $23 60; 9 in. $25 per doz dis 20 %

Awls and Tools.
Aiken's dis 25 %
Nos. 42 and 43 dis 35&10 %
Clark's dis 30&10 %
Stanley's Excelsior $18 50—dis 20&10 %

Axes.
Brook's per doz $12 00 @ 14 00 net
Blood's per doz $15 00 @ 16 50—dis 20 %
Hunt's ℘ doz $12 50 @ 14 00
Collins' ℘ doz 11 00 @ 15 50 net @ dis 5 %
B. Clark's (J. C. W. & Co.) Bronzed ℘ doz $10 00 net
Hurd's ℘ doz 10 50 @ 12 50
Simmons' ℘ doz 11 00 @ 11 50
Morris' ℘ doz 12 50 @ 13 50
Red Jacket ℘ doz 12 00 @ 12 50
Mann's ℘ doz 11 50 @ 13 00
Double Bitted ℘ doz 21 50 @ 22 00
Underhill's ℘ doz 12 00 @ 13 00
" Crown ℘ doz 12 50 @ 13 50
John Leverett's ℘ doz 12 50 @ 15 50
Ten Eyck ℘ doz $11 00 @ 12 50 net

Balances dis 35 %

Bands.
Plated new list dis 50&5 %
Iron Rim new list dis 25&5 %
Brass (Plated list) new list dis 50, 10&5 %
Oroide new list dis 50&5 %

Bells.
Hand, Light Brass dis 70&5 @ 70&10 %
Extra Heavy dis 40&10 %
White Metal dis 50&10 %
Silver Chime dis 15&10 %
Swiss dis 25 %
Globe (Cone's Patent) dis 15&10 %
Gong Abbe's dis 15&10 %
Yankee dis 30&10 %
Barton's dis 33⅓ %
Crank, Taylor's dis 25 %
Brook's dis 50 %
Cone's dis 10 %
Connel's dis 50&10 %
Lever, Sargent's dis 50&10&10 %
Taylor's dis 25 %
Hart, Bliven & Mead Mfg. Co. dis 50&10 %
Pull, " " " " dis 50&10 %
Brook's dis 50 %
Western dis 25 %
Cow—Common Wrought dis 20&10 %
Western dis 20&10 %
" Sargent's dis 50&10&10 %
Kentucky "Star" dis 20&10 %
" Sargent's dis 50&10&10 %
Dodge's Genuine Kentucky, new list—

Nos.	0	1	1½	2	3	4	5	6	Hog.
	$12·00	10·00	9·00	8·00	6·00	5·00	3·50	2·50	5·00—dis 45 %

Yaw's Genuine dis 30 %
Texas dis 35 %
Gall dis 15 %

Bellows.
Blacksmiths' dis 20 %
Moulders' dis 15 %
Hand Bellows dis 10 %

Blind Adjusters.—Domestic ℘ doz $3—dis 20 %

Blind Fasteners.
Mackrell's dis 30 %
Van Sand's, No. 2000, $13·50; No. 2705, $10·50 net
Washburn's Patent ℘ gross 14 00
Merriman's new list net

Blind Staples.
Boardman's Patent, ⅜ in. and larger ℘ ℔ 37 c
" " ⅝ in " 42 c

Blocks.
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list dis 30 %
Burr's dis 10 %
Stanley Rule and Level Co. dis 25&10 %

Bolts.
Cast Iron Barrel, Shutter, &c. dis 60&10 %
Cast Iron Chain dis 60&10&10 %
Wrought Iron Barrel dis 50, 10&10 %
" " Square dis 50, 10&10 %
" " Shutter dis 60&10 %
Wrought Iron Flush, Stanley's dis 15&10 %
" " " Sargent's dis 50&10&10 %
Carriage and Tire, Common dis 75&10&5 %
" " Norway Iron dis 50&10 %
" " R. B. & W. (old list) dis 60 %
" " Philadelphia, Star dis 55 %
" " " Eagle dis 55 %
Stove dis 20 @ 25 %
" R. B. & W. dis 20 %

Borax. 15c. ℘ ℔

Boring Machines.
Kellogg's dis 15 %
Snell Mfg. Co., Rice's Patent dis 20 %
" " Regular dis 30 %
Douglas Mfg. Co. dis 20&10 %
Parr's dis 30&10 %
Phillips' Angular, complete with Augers each $7 25
Morticing Machines each $18 00

Bow Pins.
Union Nut Co. new list dis 50&10&5 %
Hotchkiss' dis 50 @ 55 %
Humason, Beckley & Co.'s dis 50&10&5 %
Sargent & Co.'s dis 50&10&10 %

Braces.
Barber's Patent dis 40&5 %
Q. S. Backus dis 40&10 %
Wilson Mfg. Co. dis 10 %
Spofford's Patent dis 50 %
Noble's Patent dis 40&5 %
Ives' Novelty dis 40&7½&10 %
" Hamden dis 15&10 %
Common Ball dis 15&10 %

Brackets.—Shelf dis 60&10 @ 65&10 %

Bright Wire Goods dis 65&10&10 %

Bull Rings.—Union Nut Co., new list dis 50&10&5 %
Sargent's dis 60&10 %

Bung Hole Borers.
Common and Ring dis 25 %
Ives' Tap Borers dis 10&10 @ 25 %
Enterprise Mfg. Co. dis 20 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co dis 20&10 %
Bradley's dis 25 %
Beatty's dis 20 %

2	3	4	5	6	7	8	9
$19·50	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$34·25	$38·75	$43·25	$48·50	$54·00

Butts.
Wrought Brass dis 30 %
Cast Brass dis 20 %
Common Cast, not Drilled.
Fast Joint, Narrow new list, dis 30&10 %
" Broad " dis 40&10 %
" Jap'd dis 35&10 %
Loose Joint, Narrow and Broad dis 50&10 %
" " " Jap'd dis 45&10 %
Parliament Butts and Mayer's Hinges dis 40&10 %
Loose Pin, all kinds dis 45&10 %
Drilled and Wired.
Fast Joint, Narrow new list, dis 25&10 %
" Broad " dis 35&10 %
" " Jap'd dis 30&10 %
" " " with Acorns dis 30&10 %
Loose Joint dis 45&10 %
" Jap'd dis 40&10 %
" " with Acorns dis 40&10 %
Parliament and Mayer's Hinges dis 35&10 %
Loose Pin, all kinds dis 40&10 %
Wrought Iron.
Fast Joint, Narrow dis 40&10 %
" Broad dis 35&10 %
Loose Joint, Narrow and Broad dis 35&10 %
Table Butts, Back Flaps, &c. dis 30&10 %
Inside Blind, Light and Regular dis 30&10 %
Loose Pin, Wrt dis 35&10 %
Blind Butts, Parker dis 55&10 %
" Palmer dis 30&10 %
" Seymour dis 55&10 %
" Shepard dis 5 &5 %
" Lull & Porter dis 60 %
" Nicholson dis 45&10 %
" Buffer dis 33⅓&10 %
" Garretson, No. 1 dis 50&10 %
" " Nos. 2 and 7 dis 50&5 %
Blind Butts, Clark's, Nos. 1, 3 and 5 dis 55&10 %
" " No. 4 dis 60&10 @ 65&10 %
" " Nos. 2, 4, 4½, 6, 8, 10 dis 40 %
The American Spiral Spring Butt Co. dis 20 %
Standard dis 50&5 %

Caps—Percussion, per 1000.
G. D. 37 @ 40c
Ely's E. B. 1-4s, 55c.; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
Colt's 1-10s 80c gold

Carpet Sweepers.
Union each $2 75 net
Welcome each 2 75 net

Cartridges.—Metallic dis 50&10 %

Cards.—Horse and Curry dis 30&10 %
Cotton dis 10&10 %
Wool dis 15&10 %

Carpet Stretchers.
P. S. & W. per doz $2 00; dis 40&5 %
Sargent's per doz $2·88—dis 50&10&10 %

Casters.
Bed dis 30&10 @ 40 %
Plate and Shallow Socket dis 40&10 @ 50 %
Deep Socket dis 33⅓ %

Cattle Leaders new list dis 60&10 %

Chain.
English Coil net gold

℘ ℔	12	9	8½	8	7¾	7½c
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2 by the cask, ℘ pair, gold 55c
Trace, 7-10-2 by the cask, ℘ pair gold, 62c
German Halter Chain dis 20 %
German Coil dis 20 %
Galvanized Pump Chain ℘ ℔ 13c
Jack Chain, Iron dis 50 @ 55 %
" Brass dis 40 @ 45 %

Chalk.
White ℘ gross, 57c net
Red ℘ gross, 90c net
Blue ℘ gross, $1·00 net
White Crayons ℘ gross, 16½c net

Chisels.
Socket Framing, Douglass dis 60&10 %
" " Crossman dis 50&15&10 %
" " Hart Mfg. Co. dis 60&10 %
" " Merrill dis 60&10 %
" Firmers, Douglass dis 50&10&10 %
" " Crossman dis 50&10&10 %
" " Hart Mfg. Co dis 60&5 %
" " Merrill dis 60 %
Socket Corner dis 60&10 %
Tanged Firmers dis 40&10 @ 50 %
Butcher's $5·50 to £ gold
Newbould's $5·50 to £ gold
Spear & Jackson's $5·50 to £ gold

Clamps.
Cabinet dis 60&10 %
Lambert's dis 20 %
Providence Tool Co. dis 10 %

Clips, Axle.
Norway or Best dis 30 %
Superior dis 50 %
"Star," Superior Philadelphia dis 45&5 %

Coal Shovels.
Iron Handled ℘ doz, $ 85 @ 1 25
Wooden Handled ℘ doz, 1 00 @ 2 00

Coal Hods.—Smith, Burns & Co. dis 15 @ 25 %

	14	15	16	17	18 inch.
Japanned	$6·00	6·35	6·75	7·50	8·00 per doz.
Galvanized	9·50	10·00	10·75	11·50	12·50 "

Morning Glory Funnel Hods—

No.	15	16	17
Japanned	$9·00	10·50	12·00 per doz
Galvanized	13·00	14·50	16·00 "

Sidney Shepard & Co.'s new list dis 10 %

Cockeyes.—1⅛ in., 29c.; 1¼ in., 32c.; 1⅜ in., 35c. net

Cocks.
Brass Racking dis 25 %
Lock and Globe dis 25 %
Lever Bibbs dis 25 %

Coffee Mills.
Board and Box dis 15 @ 20 %
Increase Wilson's dis 15 %
Selsor's Pat. $9·50, $10·50—dis 25 %
American (Enterprise Mfg. Co.) dis 20 %
French Steel dis 15 %
The Swift dis 25 %

Compasses and Dividers.
Bemis & Call Co.'s dis 35&10 %
Cook's dis 15 %
Excelsior dis 30 %
Peck Stow & Wilcox dis 25 %

Coopers' Tools.
Bradley's dis 15 @ 20 %
Chas. E. Little dis 20 @ 25 %
Swan & Brombacher dis 15 @ 20 %

Corkscrews dis 25 %

Corn Knives and Cutters.
Bradley's dis 10 %

Crow Bars.
Cast Steel ℘ ℔ 11c. net
Iron, steel points ℘ ℔ 6c

Crucibles.—Gautier & Co. ℘ No. 5½c

Curling Irons, &c.
⅜, ⅝, ¾ in., $1·80, $2·00, $2·40 dis 10 %
Curling Tongs ℘ doz $6 50—dis 15 %
Pinching Irons ℘ doz 7 50—dis 20 %

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass dis 20&10 %
Fitch's (List of No. 240, $1) dis 20&10 %
Rubber ℘ doz, $9·00—dis 15 %
Lawrence Curry Comb Co. new list, Jan., 1875, dis 25 %

Curtain Pins.—Silvered Glass old list dis 52½ %

Cutlery.
American Table { Meriden } New list Jan. '75, dis 25 %
American Pocket { Cutlery Co } dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co. dis 20&10 %

Dippers.
Britannia per doz 7·50—dis 30 %; by bbl. dis 33⅓ %
Cocoa, Plain per doz $3·25—dis 20 %
" Rimmed per doz 3·75—dis 20 %

Dog Collars.
Embossed Gilt dis 20 %
Leather dis 20 %
Brass dis 25 %

Door Springs.
Gray's $7·50 ℘ doz—dis 50&10 %
Torrey's Patent $7·50 ℘ doz—dis 55 %
Johnson's per doz $3 00 @ 4 00
Palmer's Japanned No. 6 ℘ doz $5·00 }
" Coppered " " 6·00 } dis 20 %
" Silvered " " 8·00 }
Challenge.—
Japanned ℘ doz $4 00 @ 6 25—dis 40 %
Gem.—No. 1 large, Japanned per doz $4·00 }
No. 2 medium per doz 3·50 } dis 10 %
No. 3 small per doz 3·00 }
Barker's Concealed dis 12½ %

Drawing Knives.
Crossman's No. 1 dis 50&15&10 %
Douglass dis 60&10 %
Hart Mfg. Co., No. 1 dis 60 %
Merrill dis 60&10 %
Bradley's dis 25 %
Adjustable Handle dis 15 %

Drills.
Blacksmiths' each $2 60 net
Breast, P. S. & W. dis 15&10 %
" Miller's Falls dis 25 %
" Aiken's $2·50; 4·00, dis 45&10 %
" Hotchkiss' dis 10 %
Ratchet, Merrill's dis 20 %
" Ingersoll's dis 25 %
" Whitney's dis 20 %
" Moore's Triple Action dis 20 @ 25 %

Drill Chucks.—The Danbury each 10·00, dis 20 %
Beach Patent (Morse) dis 15 %

Egg Beaters.
Monroe's 8 in. 10 in.
Per doz $8·00 9·00 dis 10 %
Dover ℘ doz $6·00—dis 10 %
National ℘ doz $1·50—dis 20 %
Peerless ℘ doz $4·00—dis 10 %

Emery.
Genuine Chester—Regular Nos ℘ ℔ 7c } dis 10 %
" Flour and FF ℘ ℔ 4c }
Washington Mills—Regular Nos ℘ ℔ 8c
" Flour ℘ ℔ 5c

Enameled and Tinned Ware.
Kettles dis 30 @ 40 %
Sauce Pans dis 25 %
Glue Kettles dis 20 @ 25 %
Tinned Saucepans dis 25 %

Escutcheons.
Door Lock Same discounts as Door Locks
Brass Thread dis 60&10 %
Wood dis 25 %

Faucets.
Fenn's dis 50 %
" Cork Stops dis 40 %
Star dis 55&10 %
Frary's Patent Petroleum dis 15&10 %
Taylor's Pattern " dis 20&10 %
Wood and Metallic dis 40 %
Wood, Cork Lined dis 60&10 %
Enterprise Mfg. Co., Self-Measuring dis 20 %

Felloe Plates ℘ ℔ 14c; dis 10 %

Files.
American File Co. $5 00 to £ currency—dis 10 @ 15 %
Nicholson new list, Jan. 1, 1875, net
Hartford File Co. $5 50 to £ currency—dis 10 %
"Western" 5 00 to £ net
Rothery's $5 to £ currency
J. & Riley Carr 5 25 to £ gold
" " Horse Rasps 5 50 to £ gold
Stubs' 8 50 @ 9 00 to £ gold
Butcher's 5 25 to £ gold
Walter Spencer & Co.'s "Diamond" 5 25 to £ gold
Spear & Jackson's 5 00 to £ gold
Jowitt's 5 25 to £ gold
Newbould's 5 25 to £ gold
W. K. & C. Peace's "Imperial" 5 25 to £ gold
R. Ibbotson 5 00 to £ gold
Fisher's 4 75 to £ gold
Goodlad's 4 00 to £ gold
Moss & Gamble 5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.) 5 00 to £ gold
" " Horse Rasps 5 25 to £ gold
"Philo Sheffield," P. T. Co. 5 00 to £ gold
Limet & Co. (French) 5 00 to £ gold

Fluting Machines.
Mrs. Coles' Pony, 4 in., $4·75; 5 in., $5; 6 in., 5·50; 7 in., $6
Knox, with 4-inch Rolls 4 15 each net
" " 6 " " 5 05 each net
" " 8 " " 6 50 each net
O. K. 6 50 each net
Peerless, 4-inch Rolls 4 00 each net
" 5 " " 4 75 each net
Excelsior, No. 1 4 75 each net
" No. 2 6 50 each net
Diamond 7 50 each net
Champion, 6 inch rolls $6 00 each net
" 4 inch rolls $5 00 each net
Climax 7-inch Rolls 8 00 each net
" 4½ " 6 50 each net
Empire 4 00 each net
Eureka, No. 1, 7-inch Roll 8 00 each net
" No. 2, 5-inch Roll 6 00 each net
K. F. M., 4½-inch Roll 5 50 each dis 15 %
" 6-inch Roll 6 00 each dis 15 %
Myers' Fashion Fluter, 4½-inch Rolls 3 00 each net
" Convex Brass Fluter, Sad Iron attachment $1·75
Domestic Fluter $1·75 each net
Fairy, Self-Heater 00 each net
Geneva Hand Fluter $15 00 per doz net

Fluting Scissors dis 25&10 %

Forges.
"Empire" (W. P. Kellogg & Co.) dis 30 %

Forks.
Hay, Manure & Spading dis 30 %
Plated A 1 dis 50 %

Fry Pans.
Burnished, P. S. & W., new list dis 45 %

℘ doz	$3·00	3·75	4·25	4·75	5·25	6·00	7·00	8·00	9·00
No.	0	1	2	3	4	5	6	7	8

Smith, Burns & Co., "Excelsior" Polished dis 35 %

℘ doz	$3·70	4·00	4·70	5·30	6·00	7·00	8·00	9·00
No.	1	2	3	5	6	7	8	

Gas Stoves.
Tifft & Howard dis 20 %

Gauges.
Marking dis 45&10 %
Wire dis 10 %

Gimlets.
Nail and Spike dis 25&10 %
Double Cut, Shepardson's dis 20 %
" " Ives' dis 25 %
" " Douglass' dis 20&10 %

Grind Stone Fixtures
Sargent's Patent dis 65&10 %
Reading Hardware Co. dis 66⅔&7½ %
Hart Mfg. Co.'s dis 60&5&10 %

Hammers.
Emmet Hammer Co.'s Handled dis 25 %
" " Sledge & Stone ℘ ℔ 25 @ 30c net
Humason & Beckley Mfg. Co. dis 16⅔&10 %
Maydole's, new list dis 5 @ 7 %
Cheney's new list net
Verree dis 5 %
Yerks & Plumb dis 12½ %
Magnetic Tack dis 20&10 %
Warner's list net

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair } dis 25 %
" Leg Irons $6 50 per pair }
Providence Tool Co.'s Hand Cuffs $15 per doz } dis 10 %
" " Leg Irons 25 " }

Handles.
Wrought Chest dis 60&10 %
Surface Chest dis 65&10&10 %
Flush Chest dis 60&10&10 %
Lifting dis 60&10 %
Coffin dis 50&10 @ 60&10 %
Saw and Plane dis 20&10 %
Hammer and Hatchet dis 10 %
Greensboro', Axe, Pick, Hammer, &c. dis 10 %
North Carolina Handle Co. dis 10 %
Woolworth Axe, Pick and Sledge dis 10 %
Brad Awl per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 20&10 %
" " " large " 6 50—dis 20&10 %
Apple " " ass'td " 6 00—dis 20&10 %
" " " large " 7 50—dis 20&10 %
Socket " " ass'td " 3 50—dis 20&10 %
" Framing " " " 7 00—dis 20&10 %
File " " 4 00—dis 20&10 %
Auger " " 6 50—dis 20&10 %
" large " 8 00—dis 20&10 %
Patent Auger, Ives' dis 25&10 %
" " Douglass' per set $1 25—dis 10 %
" " Swan's per set $1 00—dis 10&10 %

Hangers.
Barn Door dis 65&10 %
"Anti-Friction" (Rider, Wooster & Co.) dis 30 %
Novelty dis 30 %

Harness Snaps.
Henshaw's dis 25&10 %
Judd's dis 40 %
Fitch's (Bristol) dis 30 %
Hotchkiss' dis 10 %
Andrews' dis 25 %
Sargent's dis 50&10 %
New York Wire dis 20&20 %

Hatchets.—Isaiah Blood dis 15 %
Shingling, Nos. 1 2 3 ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ℘ doz 7 50 8 00 8 50
Hunt's dis 10 %
Shingling, Nos. 1 2 3 ℘ doz $7 25 8 00 8 75
Claw, " 1 2 3 ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ℘ doz 7 50 8 25 9 00
Hurd's dis 25 %
Shingling, Nos. 1 2 3 ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ℘ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s dis 25 %
Shingling, Nos. 1 2 3 ℘ doz $6 50 7 00 7 50
Claw, " 1 2 3 ℘ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ℘ doz 6 50 7 00 7 50
Yerkes & Plumb dis 12½ %
Shingling, Nos. 1 2 3 ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ℘ doz 7 00 7 50 8 00
Simmon's dis 15 %
Shingling, Nos. 0 1 2 3 ℘ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3 ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ℘ doz 8 00 8 50 9 00
Broad, " 1 2 3 ℘ doz 9 00 10 00 12 00
" " 4 5 6 ℘ doz 14 00 16 00 18 00
" " 7 8 ℘ doz 20 00 22 00
Elephant dis 25 %
Shingling, Nos. 1 2 3 ℘ doz $8 00 8 50 9 00
Claw, " 1 2 3 ℘ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ℘ doz 8 00 8 50 9 00
J. P. Verree & Co. dis 5 %
Shingling, Nos. 1 2 3 ℘ doz $7 00 7 50 8 00
Claw, " 1 2 3 ℘ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ℘ doz 7 00 7 50 8 00
Underhill's dis 10 %
Shingling, Nos. 1 2 3 ℘ doz 7 25 8 00 8 75
Claw " 1 2 3 ℘ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ℘ doz 12 00 11 00 13 00

Hinges.
Gate, Western ℘ doz $6·25—dis 60&10 %
" N. E. ℘ doz 11·25—dis 60&10&10 %
" N. Y. State ℘ doz 7·20—dis 60&10 %
Rolled Plate dis 65&10 %
" Raised dis 65&10 %
Wrought Strap and T dis 35&10&5 %
Providence Plate. { 6 and 8 in. 11c ℘ ℔ / over 8 in. 9½c ℘ ℔ } dis 25 @ 30 %
Screw Hook and Strap { 8, 10, 12 in. 7c / 14 to 36 in. 6c } net
Heavy Welded Hook { 8 to 12 in., 6½c / 14 in. & up, 6c } net
Screw Hook and Eye { ⅝ to 1 in., 8½ / ⅜ in. 9½ / ¼ in. 11½ } net
Screw Hook and Eye, Sargent's—
⅝ ⅜ ¼ inch.
Per doz pairs $4·75 7·25 10·25—dis 65&10&10 %

Hoes.
Solid Shank, C. S. ℘ doz $8 00—dis 30 %
Socket ℘ doz 9 00—dis 30 %
Riveted Eye ℘ doz 5 00—dis 30 %
Grub dis 25 %
Planters net @ dis 5 %
Scovill add 33⅓ %
Scovill Pattern net @ dis 5 %
Lane's C. S. Cresent, American Pattern list net
" " " Scovil Pattern add 10 %

Hooks.
Bird Cage dis 60&10 @ 70&10 %
Cotton dis 50 %
Bell dis 55 @ 60 %
Bench—Skinner's per doz $8 00, dis 30&10 %
Bench—Hotchkiss' $5 00 ℘ doz dis 10 %
Bench—Weston's No. 1, $8·00; No. 2, $7·00 per doz net
" —McGill's $3 00 per doz, dis 10 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling } Hart's list dis 60&10&10 %; Sargent's list dis 60&5&10 %; Reading list dis 33⅓&10 %
Wrought Staples and Hooks and Staples dis 70&10 %
Wire Screw Hooks and Eyes dis 65&10&10 %
Grass dis 20 %
Whiffletree—Patent dis 30 %
Hooks and Eyes—Malleable Iron dis 60&10&10 %
" " Brass dis 60&10&10 %

Horse Nails.

Nos.		5	6	7	8	9	10
American Pressed	℘ ℔	22c	20c	20c	20c	20c	20c
Ausable	"	30c	27c	25c	24c	25c	22c
" P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
" " & Blued	"	32c	29c	27c	26c	25c	24c
Brundage	"	29c	26c	24c	23c	22c	21c
Buffalo Forged	"	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd	"	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin.	"	28c	25c	23c	22c	21c	20c
National, Pointed and Polished, Ex. Fin.	"	30c	27c	25c	24c	23c	22c
New London U. B.	"		29c	27c	26c	25c	24c
" " Great Western	"		27c	25c	24c	23c	22c
Perkins' Finished	"	31c	28c	26c	25c	24c	
Putnam	"	32c	28c	26c	25c	24c	23c
Vulcan, P't'd & Blued	"	33c	30c	28c	27c	26c	25c

Star Brand, 16c.; Morgan 14c
Putnam 2000 lbs., dis 5 %
Ausable, Am. Pressed, Perkins, Globe, National and New London 1000 lbs., dis 5 %
Vulcan 1000 lbs., dis 7½ %
Vulcan and Brundage 500 lbs., dis 5 %

Horse Shoes.
Burden ℘ keg, $5 62½
R. I. Horse Shoe Co., Perkins Pattern ℘ keg, 5 62½
" " R. I. Pattern ℘ keg, 6 62½
Mule Shoes ℘ keg, 6 62½

Kettles.
Brass ℘ ℔ 45c net
Enameled dis 30 @ 40 %

Knives.
Ames' Butcher Knives dis 20 %
" Shoe " dis 15 %
" Bread " ℘ doz $1·50—dis 15 %
Hay and Straw, "Wadsworth's" dis 20 %
Lothrop's Cocoa Handle Lap Bolster Butcher Knives dis 25 %

Knobs.
Carriage dis 60&10 %
Base—Common net
" Plush Tip dis 10 %
" Elastic End, No. 8 dis 30&10 %

Door, Mineral ℘ doz $2·25 }
" Por. Jap'd ℘ doz 3·00 } dis 45&5&2 %
" " Plated ℘ doz 7·00 }
" " Por ℘ doz 7·50 }

Ladles.
Melting, Hart's dis 55&10 %
" Sargent's dis 50&10 %
" Reading dis 15&10 %

Lanterns.
Tubular No. 0, $12 50—dis 15 %
Peerless No. 5, per doz $11·75—dis 10&10 %
Brady's Patent dis 10 & 10 %
Ætna dis 10 & 10 %
Yankee dis 10 & 10 %
De Beque dis 10 & 10 %

Lard Presses.
Draw Cut, 14 inch each $65 00—dis 20 %

Lemon Squeezers.
Porcelain Lined per doz $7 00, dis 15 %

Lines.
Linen Fish dis 20 %
Cotton Chalk dis 40 @ 45 %
Sil. Lake Chalk Nos. 0, 1, 2, 3, $6, 6·50, 7, 7·50, dis 20 %
Mason's dis 20 %
Galvanized Wire Clothes per doz $9·00—dis 10 %

Locks and Latches.
Cabinet—Gaylord dis 25 %
" Eagle dis 22 %
Trunk new list dis 25 %
Langstroth & Crane, Round Key dis 40 %
" " Flat Key dis 33⅓ %
Barnes & Deitz dis 25 %
Continental dis 15 %
Shepardson's dis 20 %
American Lock Co. dis 33⅓ %
Plate dis 25 %
Yale Lock Co. dis 40 %
Sargent & Greenleaf dis 20 %
Trenton, Branford, Norwich, Russell & Erwin, Norwalk, Nashua, Mallory, Wheeler & Co., P. & F. Corbin, Parker & Whipple, Jacobus & Nimick Mfg. Co. } Rev'd list of Jan. '75 dis 45&5 %. 2 % extra for cash.
Padlocks, Russell & Erwin, Mallory, Wheeler & Co., Wm. Wilcox & Co. } List of Jan., '75. dis 50&5&2
" Romer's dis 15 %
" Vulcan Hardware Co. dis 20 %
" New York Lock Co. dis 20 %
" J. H. McWilliams dis 5 %
" Scandinavian Jail dis 10 %
" Barnes & Deitz dis 25 %
" D. K. Miller Lock Co. dis 30 %
" Penn Lock Works dis 20 %

Mallets.
Hickory and Lignumvitæ dis 20 %

Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
℘ doz. $14 00 $17 00 $19 00 $30 00 dis 10 %
Miles Challenge Nos 1 2 3
℘ doz. $22·00 $30·00 $40 00—dis 20 %
Perry's (P. S. & W.) Nos. 200 300 400
℘ doz. $22·00 $27·00 $40·00—dis 10 %
Woodruff's (P. S. & W.) Nos. 100 150
℘ doz. $15·00 $18·00—dis 10 %
Hales' Nos. 11 12 13
℘ doz. $27·00 $33·00 $42·00—dis 25 %
Draw Cut Nos. 5 6 7
Each $56·00 $90·00 $250 00—dis 20 %
American dis 25 @ 25&5 %

No.	1	2	2½	3	4	B	5
Each	$6·00	$9·00	$12·00	$15·00	$30·00	$60·00	$75·00

Molasses Gates.
Stebbins' dis 65&10 %
" Tinned ends dis 40&10 %
Bush's dis 20 %
Lincoln's dis 50 %
Weed's dis 15 %

Mortars and Pestles.
Iron net

Nails. See Trade Report

Nuts and Washers.
Nuts large, 6c; small, 8c off list.
Washers large, 8c; small, 10c off list.

Oilers.
Miller's Zinc, Brass and Copper dis 40 %
Sheet Metal Screw, Zinc dis 37½ %
" " " Brass dis 33⅓ %
Olmsted's dis 25&10 %
Broughton's dis 25&5 %
Malleable per doz $5 00 dis 10 %
Prior's Patent or "Paragon" dis 30&10 %

Ox Shoes.
Concave ℘ ℔ 13c net

Ox Balls dis 60&10 %

Pencils
Faber's Carpenters' net
" Round Gilt ℘ gross $6 00 net
Dixon's Lead ℘ gross $4·50 net
" Lumber ℘ gross 9·00 net

Picture Nails and Knobs.
Brass Head dis 60&10 %
Porcelain Head dis 35&10 %
Richards' Patent dis 40 @ 40&10 %
Judd's dis 60&10 %

Pinking Irons per doz $2 75—dis 65 %

Planes.
First Quality dis 35 %
Second Quality dis 50 %
Bailey's Patent Adjustable dis 20&10 %
Plane Irons, Butcher's $5 50 to £ gold—new list
" Auburn Tool Co.'s dis 25 %
" Greenfield Tool Co. net list
" Middletown Tool Co. net list
" Ohio Tool Co. dis 10 %
" Spear & Jackson's 5 50 to £ gold—new list
" Sandusky Tool Co dis 10 %
Plow Bits, Greenfield Tool Co. dis 10 %

Pliers and Nippers.
Button's Patent dis 33⅓ %
Hull's Patent Nippers dis 25 %
Leach's Patent Wire Cutters per doz $6 50—dis 15 %

Plumbs and Levels.
Chapin's dis 66⅔&10 %
Standard Rule Co.'s New Adjustable dis 60&10 %
Standard Rule Co.'s Non-Adjustable dis 60&10 %
Stanley R. & L. Co.'s Pat. Adjustable dis 60&10 %
" " Non-Adjustable dis 65&10 %
Pocket Levels dis 50&10 %
Johnson's Patent Adjustable dis 60&10 %

Pulleys.
Hot House and Tackle dis 60&10 %
Jap'd Screw dis 60&10 %
Brass Screw dis 60&10 %
Jap'd Side dis 60&10 %
" Clothes Line dis 60&10 %
Hay Fork per doz $4 50 @ 5 00, dis 10 %

Pumps.
Douglas Cistern, etc. new list dis 25 %
" S. & F. new list dis 20 %
Union Mfg. Co's. Cistern and Pitcher dis 25 %
" " " Rams dis 20 %
" " " Garden Engines dis 10 %
Cucumber (Burlingham & Purdy)—
6 ft. No 3, with 12 ft. pipe $4·00 net
6 ft. No. 1, with 12 ft. pipe 4·50 net
From 6 to 36 ft. add 20 cents per ft.
Pipe, 8c. per ft.; Coupling, 20c. per ft.

Punches.
Belt or Drive per doz $1·50 net
Spring per doz $7·00—dis 20&10 %

Rail.
Sliding Door, Wrought Brass ℘ ℔ 44c., dis 10 %
" " Iron, Painted ℘ foot 9c—dis 55&10 %
Barn Door, ½, ⅝ and ¾ inch dis 60&10&10 %
" " for N. E. Hangers dis 60&10&10 %

Rakes.
Cast Steel dis 30 %
$8 00 9 00 10 00 11 00
8 10 12 14 teeth.
Malleable dis 30 %
$5 00 5 50 6 00 6 50
9 11 13 15 teeth.

Razor Straps.
Evan's dis 25&10 %
Genuine Emerson (B. F. Badger or C. Emerson) dis 15 @ 25 %
Imitation Emerson ℘ doz $2·75—dis 40 %
Hunt's dis 40 %
Chapman dis 10 @ 15 %
Torrey's dis 10&10 %
Saunder's net @ 10 %

Rivets.—Old Colony.
Iron and Tinned dis 25&7½ %
In bulk dis 7½ %
Copper Rivets and Burrs dis 20 %

Nos.	7	8	9	10	11	12	13	14	15
Per lb.	49c	50c	52c	54c	56c	58c	60c	65c	70c

Rivet Sets net

Rods.
Stair new list dis 30 @ 33⅓ %
" American Patent dis 33⅓ %

Rollers.
Barn Door revised list dis 60, 10&10 %
Novelty dis 10 %

Rope. Manufacturers' List of Mar. 8, 1875.
Manila ¾ inch and larger ℘ ℔ 14½c
" ⅝ inch ℘ ℔ 15 c
" ¼ and 5-16 inch ℘ ℔ 15½c
Manila Lath Yarn and Tar'd Rope ℘ ℔ 14 c
" Hay Rope ℘ ℔ 15 c
Sisal ¾ inch and larger ℘ ℔ 12 c
" ⅝ inch ℘ ℔ 12½c
" ¼ and 5-16 inch ℘ ℔ 13 c
" Hay Rope ℘ ℔ 12½c

Rules.
Chapin's Boxwood dis 66⅔&10 %
" Ivory dis 50&10 %
Hubbard & Curtiss Mfg. Co. dis 60&20 %
Stanley Rule and Level Co.'s Ivory dis 50&10 %
" " Boxwood dis 70 %
Standard Rule Co.'s Boxwood dis 70 %
" " " Ivory dis 50&10 %
Stephens & Co., Boxwood dis 70 %
" " Ivory dis 50 %

Sad Irons.
From 4 to 10 lbs ℘ ℔ 3¾ @ 4c net
Sad Iron, Nickel Stand attached ℘ ℔ 9c
Self-Heating per doz $10 00 net
" " Tailors' per doz 22 25 net

Sand Paper.
Beader & Adamson's (Flint) 00 to 1½ $4 25 ℘ ream }
" " 2, 2½ & 3 4 75 " }
" " Assorted 4 25 " } dis 15 %
" " Star ℘ ream $3 25 }
" " Emery ℘ ream $6 50 @ 11 50 }
H. B. & M. Roman Flint dis 15 %

Sash Cord.
Common ℘ ℔ 20 @ 22c. net
Silver Lake, Russia Flax ℘ ℔ 55c }
" " White Cotton ℘ ℔ 55c } net
" " Drab Cotton ℘ ℔ 60c }

Sash Locks.
Clark's, Nos. 1 and 2 dis 33⅓ %
Ferguson's dis 33⅓ %
Norwich dis 15 %
Walker's list net

Sash Weights.—Solid Eyes ℘ ℔ 3c

Sausage Stuffers or Fillers.
Miles ℘ doz $20—dis 10 %
Stow or Perry ℘ doz No. 1, $15; No. 0, $21—dis 15 %
Draw Cut No. 4 each $30 00—dis 20 %

Saw Frames per gross $18 00—dis 10&10 %

Saw Rods $10 list, dis 10&10 %

Saws.
Spear & Jackson's old pattern $4 50 to £ gold
Spear & Jackson's American Pattern $3·55 to £ gold
John Spear $3 60 to £ gold
Am. Saw Co. new list
Perforated Cross Cuts, all kinds 68c ℘ foot
Inserted Tooth dis 10 %
All else dis 12½ %
Disston's Circular dis 20 %
" Mill dis 25 %
" Cross Cut dis 15 %
" other kinds dis 12½ %
Livingston's Framed Wood list net
Livingston's Butcher and Kitchen dis 12½ %
H. W. Peace's Circulars dis 10 %
Other kinds dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw dis 10 %
" " " Compass Saw net.
E. M. Boynton's Lightning dis 40 % for immediate cash
" " Others dis 15 %
Wheeler & Clemson Mfg. Co.'s Hand dis 15 %
" " " " Cross-Cut dis 30 %

Saw Sets.
Stillman's Genuine ℘ doz $5·00—dis 10 %
" Imitation ℘ doz 3·25—dis 10&10 %
Aiken's Pattern ℘ doz 7·00—dis 25&10 %
" Genuine ℘ doz $15·00—dis 25 %
Hart's Patent dis 15 %
Nash's dis 20&10 %
Bemis & Call's dis 20 %
Hotchkiss' ℘ doz 5·50—dis 10 %
Common Lever per doz $2 00—dis 10&10 %
Leach's dis 15 %

Scales.
Hatch, Counter ℘ doz $36—dis 25 %
" Tea ℘ doz $15—dis 25 %
Turnbull's dis 20 %
Brown's dis 25&5 %
Fairbanks' new list dis 15 @ 20 %
Howe's dis 15&5 %
Shattuck's Counter and Union dis 15 %
Chatillon's Grocers' dis 25 %
Eureka dis 25 %
Universal Family dis 20 %
Scale Beams.
No. 1 300 to 1200 lbs 90c ℘ cwt } dis 33⅓ %
No. 2 " " 75c ℘ cwt }

Scrapers.
Box, 1 Handle per doz $6·25, dis 10 %
" 2 " per doz 7·50, dis 10 %
Foot dis 60 & 10 %
Ship (common) per doz $3 00 net
Ship—Providence Tool Co. dis 10 %

Screws.
American list of Jan. 1, 1874.
Flat Head Iron dis 62½ %
Round Head Iron dis 50 %
Flat Head Brass dis 52½ %
Round Head Brass dis 50 %
Round Head Silver Capped, List March 1 dis 25 %
Hand Rail dis 55&10 %
Coach or Lag dis 30&10 @ 40 %
Coach, Patent Gimlet Point, List Jan. 1, 1875 dis 35 %
Bed list net
Japanned (List of Flat Head Iron) dis 40 %
Machine—Flat Head, Iron, List Jan. 12, 1875 dis 25 %
" " Brass, " " dis 15 %
Round Head, Iron, " " dis 20 %
" " Brass, " " dis 10 %
English, Flat Head, Iron—
Nettlefold & Chamberlain's dis 60&10 %
Birmingham Sc'w Co. dis 60&10 %
Bench—Iron dis 60, 10&10 %
" —Wood, Beach ℘ doz $3·00 net
" " Hickory dis 20&10 %
Hand dis 25&10 %
Jack—Bell Bottom dis 15 %

Scythes.
Blood's German Steel, Grass ℘ doz $9 00
" Cast " " ℘ doz 10 00
" Silver " " ℘ doz 11 00
" German " Grain ℘ doz 13 00
" Cast " " ℘ doz 14 00
" Red Rover 12 00
" Young America 9 50
" Silver Clipper 12 63
Scythe Snaths dis 20 %

Sieves.—Mann's Patent dis 25 %
Iron Bottoms, 14 mesh ℘ doz $4·10
" 16 " ℘ doz 4·00
" 18 " ℘ doz 4·25
" 20 " ℘ doz 4·50
" 24 " ℘ doz 4·75
" 30 " ℘ doz 6·50
Plated Bottoms, 14 mesh ℘ doz 4·75
" 16 " ℘ doz 5·00
" 18 " ℘ doz 5·25
" 20 " ℘ doz 5·50
" 24 " ℘ doz 5·75
" 30 " ℘ doz 6·50

Shears.
Cast Steel dis 70&10 %
Cast Iron dis 25&10 %
Seymour's Straight Trimmers dis 60&10 %
" Scissors dis 45&10 %
Pruning per doz $9 00—dis 20&10 %

Sheaves.
Sliding Door dis 45&5&2 %
" Patent Roller dis 25 %
" " Hatfield's High list, dis 50 %
" Russell's Anti-Friction dis 50 %
Sliding Shutter dis 50&10&10 %

Shovels and Spades.
Ames dis 12½ %
Birmingham Shovel Co. dis 15 %
Rowland's dis 25 %
Old Colony new list dis 10&5 %
Middleboro' Shovel Co. new list dis 12½ %
C. E. Jennings dis 12½&5 %
Dunning's Shovels and Scoops dis 20&7½ %
Snow Shovels ℘ doz $7 00 @ 8 00 net

Shovels and Tongs.
Iron and Brass Head, R. & E. list dis 50 %
" " Hart's dis 50&10 %
Polished Steel new list dis 50 %

Skates.
Barney & Berry's
N. Y. Club ℘ pair $2·75 }
B. & B. Club " 3·50 } dis 25 %
All Clamp " 4·25 }
Rink " 8·00 }
Florence Club per pair $3·50—dis 25 %
" Steel per doz $9 net
Peck & Snyder's—
American Club, Polished ℘ pair $5·00
" " Blued Top ℘ pair $3·75 net

Slates.
Square Frames, Round Cornered, by case dis 40&10 %
Less than a case dis 70 %

Spoke Shaves.
Iron dis 33⅓&10 %
Wood dis 30 %
Bailey's dis 20&10 %

Spoons.
Iron dis 10 %
By the case dis 20 %
Britannia dis 50 @ 50&5 %
" Boardman's dis 55 %
Rogers & Bro., A 1 dis 50 %
Derby Silver Co. dis 50 & 5 %
Holmes, Booth & Haydens dis 50 %
Nickel Silver Co. dis 40 %
German Silver dis 30 %
Tinned (P. S. & W.)—
Teas $1·50 ℘ gross, net
Tables 2·75 " net

Stocks and Dies dis 5&10 %

Stone.
Hindostan Stone ℘ ℔ 6c }
" Axe Stone ℘ ℔ 8c } dis 20&10 %
" Slips ℘ ℔ 10c }
Sand Stone ℘ ℔ 6c—dis 20&10 %
Washita Stone No. 1, ℘ ℔ 22c net
" No. 2, ℘ ℔ 17c net
" Slips No. 1, ℘ ℔ 45c net
Arkansas Stone No. 1, ℘ ℔ $1·25 net
" Slips No. 1, ℘ ℔ $2·00 net
Grindstones, Family, J. F. Green & Bro dis 20 %

Stove Polish.
Joseph Dixon's ℘ gross, 6 00
Gold Medal ℘ gross $6 00 dis 15 %

Squares.
Steel dis 50 %; full cases, dis 50&10 %
Iron dis 50 %; full cases, dis 50&10 %
Nickel Plated add $2 50 @ $4 00 ℘ doz net
Try Squares and T Bevels dis 45&10 %
Star Try Squares and Bevels dis 30 %
Disston's Try Squares No. 1 dis 20 %
" " No. 2 dis 40 %
" " Improved dis 20 %

Tacks.
Full Weight American Iron dis 45&7½ %
Half Weight American Iron dis 72½&7½ %
Carpet dis 7½ %
Brads American Half Weight dis 50&7½ %
Finishing Nails ¼ ⅜ ½ 1 1¼ in. and over
℘ ℔ 25c 20c 15c 14c 12c dis 7½ %
Trunk and Clout ¼ ⅜ ½ 1 1¼ in. and over
℘ ℔ 25c 20c 15c 14c 12c dis 7½ %
Copper Tacks ℘ ℔ 30c—dis 7½ %
Iron Shoe Nails, ℘ ℔ 4-8 and longer, 9½c; 3½-8, 10c dis 7½ %
Double Pointed dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co. dis 20 %
Eddy's dis 20 %

Tea Trays.
American Tea Tray Co. dis 15 %

Thermometers.
Tin Case dis 50&10 %

Toe Calks.
℘ ℔ 15c net

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)....dis 20 %
Morse's....₩ doz $12·00—dis 10&10 %
Wood Bottom....per doz $12—dis 25&10 %
All Iron....per doz $10·50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W....list net

Traps.
Newhouse....dis 20 %
Peck, Stow & Wilcox....dis 30 %
Blake's Patent....new list dis 25 %
Mouse, Wood Choker....₩ doz holes. 15 @ 16c
" Patent Choker (Union Nut Co.)....₩ doz holes 16 @ 18c net
" Round, Wire....₩ doz $1 80 to 2 00 net
" Square, "....₩ doz 2 00 to 2 50 net
Cage, "....₩ doz 2 50, dis 10 %

Trowels.
Lothrop's Brick and Plastering....dis 10 %
Disston's Plastering....dis 12½ %
Disston's Brick....dis 12½ %
Rose's Brick....dis 5 %
Brades' Brick....gold. dis 10 %
Worrall's Brick and Plastering....dis 20 %
Garden....dis 25 %

Triers.
Butter and Cheese....dis 25 %

Ventilators (Window).
Nickel and Gilt....per dozen $16·00 @ 18·00

Vises.
Trenton Vises, Solid Box.
30 to 160 lbs....16c
160 and over....15c
Peter Wright's....₩ lb 15⅛c. gold
Wilson's Solid Box....dis 15 %
39 to 160 lbs....18c
160 and upward....22c
Wilson's Parallel....dis 30 %
Sargent's "....dis 50&10&10 %
Backus & Union, Parallel....dis 25 %
Buffalo, Parallel....new list dis 25 %
Fisher & Norris' Double Screw Parallel....dis 15&10 %
Trenton Parallel....dis 15 %
Merrill's Parallel....dis 15 %
Parker's....dis 20 %
Stephens' Parallel....dis 15 @ 20 %
Bonney's Saw Filers....per doz $20—dis 25 %
Stearn's Saw Filers....per doz $20—dis 25 %

Wheel Barrows.
Canal (Pugsley & Chapman)....new list dis 10 %
Coal, Garden and Stone (Pugsley & Chapman)....dis 25

Well Wheels.
Revised list....dis 60&10 %

Wire.
Brass and Copper....dis 10 %
Bright and Annealed....Nos. 0 @ 18 dis 45 @ 50 %
" " ....19 @ 26 dis 50 @ 55 %
" " ....27 @ 36 dis 55 @ 60 %
Coppered....0 @ 18 dis 40 @ 45 %
Galvanized, Nos. 0 to 9....₩ lb 8½ @ 9c net
Galvanized, Nos. 10 to 18....market list dis 10 @ 15 %
Tinned....dis 25 @ 30 %
Cast Steel....dis 15 @ 20 %
Tinned Broom Wire....dis 30 @ 35 %
Galvanized Telegraph, Nos. 8 and 9....₩ lb 9c @ 9½c
Galvanized Telegraph, Nos. 10 and 11....₩ lb 10c @ 10½c
" " " 12....₩ lb 10½c @ 11c
Annealed Fence, Nos. 8 and 9....dis 45 @ 50 %
" Grape, " 10 to 14....dis 45 @ 50 %
Fence Staples....₩ lb 7½ @ 8 %
Stubs' Steel Wire....$7 00 to 8 gold
Judd's Picture Wire....dis 50

Wrenches.
American Adjustable....dis 45 %
Baxter's Adjustable "S"....dis 20 %
" Diagonal....dis 20 %
Collins & Co.'s....dis 45 %
Coes' Genuine....dis 40&5 %
" Pattern (Wrought)....dis 50&10 %
" " (Malleable)....dis 60&10 %
Lindsay's Patent....dis 25 %
Taft's Pattern....dis 70&10 %
Davis Patent Duplex....new list dis 25 %
Bemis & Call's Patent Combination....dis 20&5 %
" " Merrick's Pattern....dis 25&2½ %
" " Brigg's Patent....dis 15&10 %
Aiken's Pocket....per doz $10·00—dis 4 & 10 %

Wringers.	Less than 2 doz	2 doz lots
Providence	₩ doz $64 00	$62 00
Reliance	₩ doz 61 00	59 00
Universal—Extra	₩ doz 64 00	62 00
Novelty	₩ doz 64 00	62 00
Sherman	₩ doz 64 00	62 00
Eureka (Friction)	₩ doz 60 00	58 00

TIN WARE AND TRIMMINGS.

STAMPED TIN WARE, dis 5 %.

COMMON STAMPED WARE, &C.

Bucket Covers.

Quarts	½	1	2	3	4
Inch	4⅛	5 3-16	6 5-16	6⅞	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Quarts	6	8	10	12	
Inch	8⅝	9⅛	9⅞	10 9-16	
Per gross	$6·50	8·00	8·50	11·50	

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11⅛	12⅞	13⅞
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7⅞	8⅛	8⅞	9⅛	9⅞	10⅛
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10⅞	11⅛	11⅞	12⅛	12⅞	13⅛
Per gross	$8·75	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	5·50	5·90	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1½	2	3	4	5	6 qts.
Inch	3	3⅛	3⅞	4⅛	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Rimmed	2⅞	3	3⅛	4	4⅛ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7⅛	8	8⅛	9	9⅛	10	10⅛	11	11⅛
Per gro.	$6·00	6·50	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes....per gross,	$8·00	11·50
With Tubes	10·50	14·00

Stamped Square Pans.

No.	½	
Per gross	$7·50	14·50

Common Square Pans (One Sheet).
Per gross....$11·50

Milk Skimmers (Plain or Pierced).
Per gross....$4·00

Lettered Plates.

Inch	5⅛	6
Per gross	$3·25	4·00

Steamer Bottoms.
Add $1 per gross, or 10c. per doz. to list of Pot Covers.

Tin Stove Pipe Rings.

Inch	4	4⅛	5	5⅛	6	7
Plain....per gro.	$4·00	4·50	5·00	5·50	6·00	7·00
Jap'd or Burn'd	6·00	6·50	7·00	8·00	9·50	10·00

Coffee Boiler Lips.

	Small.	Large.
To Rivet....per gross,	$0·80	1·10
To Solder	1·25	

DEEP STAMPED AND RETINNNED WARE, dis 25 %

Plain Stamped Water Dippers.

	½ pint.	Pint.	Quart.	quarts.	2½ quarts.
Per doz	·90	1·15	1·50	1·85	2·50

Retinned Milk Pans.

Qts.	½	1	1½	2	3	4	5	6	8	10	12
₩ doz.	1·20	1·50	1·75	2·00	2·25	3·15	3·50	3·85	4·75	5·25	5·75

Dipper Bowls, Plain Stamped—
Pints....½ 1 / Per doz. ·50 ·75 — Quarts.... 1 2 2½ / Per doz.. 1·00 1·25 1·75

Dipper Bowls, Retinned—
Pints....½ ¾ 1 / Per doz. ·75 ·95 1·05 — Quarts.... 1 2 2½ / Per doz .. 1·40 1·75 2·25

Pans.
Dish Pans, Retinned Deep—

Quarts	7	8	10	14	17	21	30
Per doz.	8·50	9·50	11·00	13·00	16·00	19·00	30·00

JAPANNED TIN WARE, dis 5 %.

Cannisters, Common.... Pound ½ 1 2 3
Per gross $10·50 15·00 24·00 30·00
Canisters, Hinged.... Pound 1 1½ 2 3 4
Per gross $19·00 25·00 32·00 37·00 42·00
Canisters, Square.... Pound 2 4 6 8 12 16
Per doz $3·00 4·25 5·00 5·75 8·00 9·00
Candlesticks, Japanned.... No. 1 2
Per gross $8·00 7·00
Cake Boxes, Round....per nest, $3·25
Square....per nest, 4·25
Chamber Pails, Japanned

Nos.	2	3	4	5
Green, per doz.	$8·00	9·00	11·00	13·00
Oak "	$9·00	11·00	12·00	13·50

Dust Pans, Corrugated....per gross, $22·00
Box Graters....per gross, $3·75
Molasses Cups.... Pint ½ 1 2 4
Per gross $15·00 16·00 28·00 42·00
Lunch Boxes, per doz....7 in $2·00; 8 in. $2 50
Pepper Boxes Japanned..₩ gross small, $3·00; large, $4·00
Toy Banks, House.... No. 1 2
Per gross $7·00 5·50
Toy Banks, Gothic....No. 1. $6·00, No. 2, 4·00 per gross
Toy Cups, Straight.... No. 1 2 3
Per gross $3·75 3·25 2·75
Toy Cups, Flaring....No. 1, $4·25; 2, $3·75 ₩ gross
Toy Pails, Covered....No. 1, per gross $4·00
Toy Rattles....per gross, $2·00
Trunks, Wire Handled....per nest (5) $1·75
Spittoons, Tin....per gross, $27

PLANISHED TIN WARE, dis 25 @ 30 %.

Planished Coffee Pots, Round.

Each	·60	·75	·85	·95	1·15	1·25	1·30	1·40
Pints	1	2	3	4	5	6	7	8

Planished Tea Pots, Round.

Each	·70	·80	·95	1·05	1·25
Pints	2	3	4	5	6

Planished Tea Pots, Oval.

Each	·70	·80	·90	1·05	1·15	1·40	1·75
Pints	1	2	3	4	5	6	8

Planished Pepper Boxes, No. 1....per doz, $1·52
Planished Flour Dredges, No. 3, $2·10; 4, 2·45 ₩ dozen.

Planished Round Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·00	1·10	1·20	1·40	1·60	2·00

Planished Oval Coffee Biggins.

Pints	2	3	4	5	6	8
Each	$1·15	1·25	1·40	1·60	1·80	2·25

Planished Oval Chafing Dishes, Imperial Covers.

Inch	10	12	14	16	18	20	22	24
Each	$3·85	5·00	6·25	7·60	9·00	11·50	15·00	16·50

Planished Oval Chafing Dishes, Low Covers.

Inch	10	12	14	16	18	20
Each	$3·25	4·35	5·20	6·20	7·80	9·25

Planished Low Dish Covers.

Inch	10	11	12	14	16	18	20
Each	$·70	·80	1·00	1·25	1·50	2·00	2·75

Planished Imperial Dish Covers.

Inch	10	11	12	14	16	18	20	22	24
Each	$1·55	1·70	2·00	2·60	3·15	3·45	4·60	5·45	6·30

Planished Etnas on Stands.
Pints 1½ 3 4 5
Each $0·90 1·00 1·20 1·50 1·75

Planished Liquor Mixers....Nos. 0 1 2
Per doz $2·00 2·10 2·45

Planished Oval Melon Molds.

Nos.	2	3	4	5	6	7	8	9
Each	$·60	·65	·70	·80	·90	1·00	1·15	1·35

Planished Oval Tumbler Warmers.
To fit 1, 2, 3, and 4 O. G. Urns....each, $2·50

Planished Oval O. G. Urns.

Nos.	0	1	2	3	4	5	6	7	8
Each	$4·90	5·45	6·30	7·00	7·75	9·25	11·25	12·50	13·50

Planished Round Urns.

Nos.	0	1	2	3	4	5	6	7
Each	$4·20	4·85	5·45	6·30	7·75	9·00	11·00	14·25

Planished Round Oyster Dishes, (Complete)..Nos. 1 2 / Each $2·10 2·80
Planished Oyster Dish Plates....Nos. 1 2 / Each $0·25 0·30
Oyster Dish Covers....Nos. 1 2 / Each $0·30 0·35

Tea Pot Handles—P. S. & W....dis 20 %
Stow's Patent Hollow Tea Pot Handles.
No. 1, Small 4½ inches....per gross, $11·50
No. 2, Medium, 5⅜ "....12·50
No. 3, Large, 6⅜ "....13·50
No. 4, Ex. Large 7⅛ in., for Wash Pitchers &c....18·00
Solid Iron, Tin Tipped.
No. 10, Small, 4½ inches....per gross, $9·00
No. 15, Medium, 5⅜....9·50
No. 20, Large, 6⅜....10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.
No. 12, Bronzed and Tin-Tipped....per gross, $13·50
Saucepan Handles. Of Best Malleable Iron.
P. S. & W....dis 20 %
Japanned.
No. 1, 5⅛ inches long....per gross, $3·50
No. 2, 6....3·75
No. 3, 6⅜....4·00
No. 4, 7⅛....4·25
No. 5, 8....4·50
No. 6, 9....4·75
Tinned.
No. 1, 5⅛ inches long....per gross, $4·25
No. 2, 6....4·50
No. 3, 6⅜....4·75
No. 4, 7⅛....5·25
No. 5, 8....5·50
No. 6, 9....5·75
Japanned....per lb., ·16
Tinned...." ·20
Iron Kettle Ears (P., S. & W.)....dis 45 %
Half gross pairs in a package.
Tinned.
Nos. 1 2 3 4 5 6 7
Per gross pairs..88c $1·00 1·50 1·75 2·10 2·75 3·75 [illegible]
Black.
Nos. 1 2 3 4 5 6 7 8
Per gross pairs...75c 88c $1·35 1·50 1·75 2·25 2·75 4·00
Tinned Tea Kettle Ears.
Nos. 4 5 6
Per gross pairs $1·75 2·10 2·75
Extra Heavy Tinned Kettle Ears—French Pattern.
Nos. 1 2 3 4 5 6 7
Per gross pairs $1 00 1·25 1·50 1·75 2·00 2·50 3·00
Malleable Iron Kettle Ears for Coal Hods &c.,
P., S. & W....dis 20 %
No. 10 Small....₩ lb, Tinned 20c; Black, 16c
No. 20 Medium....₩ lb, " 20c; " 16c
No. 30 Large....₩ lb, " 20c; " 16c
No. 40 Extra Large....₩ lb, " 20c; " 16c
In cases of 100 lbs. each.
Milk Can or Boiler Handles—(P. S. & W.) 4½ in..dis 25 %
Plain, 8c.; Japn'd, 9c.; Tinned, 15c. per lb.; Malleable Clips or Ears to match, Tinned....20c per lb.
Toilet Ware Handles—4½ inches (P. S. & W.)....dis 35 %
Plain with drilled holes, per lb....9c
Plain with Cast " "....8c
Plumbers' Scrapers—(P. S. & W)....dis 25 %
Extra quality, length 6 in., per doz....$4·00

METALS.

IRON.—DUTY Bars, 1 to 1½ cents per lb., Sheet, Band, Hoop and Scroll, 1½ to 1⅞ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb.

Pig Iron—AMERICAN.
Foundry No. 1....₩ ton, $28 00 @
Foundry No. 2...." 26 00 @
Gray Forge...." 24 00 @ 26 00
White and Mottled...."

SCOTCH.
Coltness...." 36 00 @ 38 00
Glengarnock...." 36 50 @ 37 00
Eglinton...." 33 00 @ 34 00

Bar Iron.
Am. Refined, at mill....nominal....

Rails.
Welsh, gold....₩ ton,
American, at works, currency...." 48 00 @ 58 00
Old Rails....30 00 @ 31 00

Scrap.
Wrought Scrap...." 35 00 @ 37 00

Bar Iron from Store.
Common Iron.
⅜ to 2 in. round and square.... }
1 to 6 in. x ⅜ to 1 in.... } ₩ ton $60 00 @ 62 50
Refined Iron.
⅜ to 2 in. round and square.... }
1 to 6 in. x ⅜ to 1 in.... } " 65 00 @ 67 50
1 to 6 in. x ¼ and 3-16...." 70 00 @ 72 50
Shafting Iron—2⅜ to 4 in...." 72 50 @ 92 50
Rods—3-16 to ⅝ round and square.." 67 50 @ 120 00
Bands...." 80 00 @ 82 50
Hoops—⅜ to 2 in...." 87 50 @ 140 00
Swedish Iron.
Ordinary sizes...." 132 50 @ 135 00
Plow size...." 145 00 @ 150 00

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20....₩ lb	4¾	5⅛c	5⅛c
21 to 24...."	4¾ @ 4⅞c	5⅛c	5⅜c
25 to 26...."	4⅞c	5⅜c	5⅜c
27...."	5c	5⅞c	6c
28...."	5⅛c	5⅞c	6⅛c

Galvanized, 14 to 20, prime, ₩ lb 9; 2d quality....₩ lb 8c
" 21 to 24 " " 10 .... " 9c
" 25 to 26 " " 11 .... " 10c
" 27 " " 12 .... " 11c
" 28 " " 13 .... " 12c
Patent Polished....₩ lb 14c
Russia, Nos. 8 to 16...." 17c
" Stained, No. 1...." 16c
Belgian...." 10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4½	5	5½	6	7 inch.
$2·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$5·00	7·00	9·50	12·00	14·00 per doz.

COPPER DUTY. Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ lb; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot....₩ lb 22 @ 22½c
English "....

SHEATHING, BRAZIERS COPPER, BOLTS, &C.
Braziers Copper, ordinary sizes, over 16 oz., per square foot....33c ₩ lb
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot....35c. "
Braziers' Copper, 12 oz. per square foot and lighter.39c. "
Circles less than 84 inch in diameter....35c ₩ lb
Circles, 84 inch diameter and over....39c. "
Segment and Pattern Sheets....35c. "
Locomotive Fire Box Sheets....33c. "
Sheathing Copper, over 12 oz. per sq. ft....31c. "
" " 12 oz. ₩ sq. ft. and lighter...39c. "
Bolt Copper....33c. "
Copper Bottoms 32 c. ₩ lb....net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier....38c. By the case, c. ₩ lb
12 oz. and lighter....39c. " " 38c "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier....38c. By the case, 37c. ₩ lb
(And all sizes not over 30 inches wide.)
30x60
14 and 16 oz. and heavier....40c. ₩ lb
12 oz....43c. "

TINNING.
x48, by the case....8c. ₩ sheet
x48, less than case....10c. "
Boiler Sizes, 7 and 8 inch....12c. "
" 9 inch....15c. "
Other sizes not larger than 30x60....3½c. ₩ sq.
Larger than 30x60....5c. "

LEAD.—DUTY Pig $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 3½ cents per lb.
Spanish....6⅞ @ 7c gold
German Refined....6⅝ @ 6⅞c gold
English....6⅞c. gold
American....6⅝ @ 6⅞c gold
Bar....dis 10 %....8⅝c.
Pipe....dis 10 %....9c.
Tin Lined Pipe....dis 10 %....16⅞c.
Sheet....dis 10 %....9⅛c.
Shot....dis 10 %. Drop, 10c. Buck, 11c.

BABBITT METAL.
S. P. U....₩ lb 8⅛ @ 9c
A, 25c.; B, 20c.; C, 15c.; D 12c., ₩ lb.

SOLDER....No. 1, 15c; No. 2, 13⅛ @ 14c

STEEL.—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 3¼ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool....15 @ 16c
Spring....10c
Homogeneous....12½c
Tire....12½ @ 13½c
Machinery (round and square)....10 @ 11c
File....11c
Sheet....14 @ 16c
Saw Plate, mill and mulay....14 @ 16½c
Saw Plate, gang and X cut....13 @ 14c
" circular as to size....18 @ 30c

Chrome Steel.
Tool....₩ lb 20 @ 21c
Tool, extra fine...." 40 @ 75c
Spring....₩ lb 12c and upward
Machinery....₩ lb 11c
Hammer...." 15c,
Gun or Homogeneous...." 16c

English Steel,—payable in gold, net.
" Best Cast....₩ lb 17½c
" Extra Cast...." 14½c
" Round Machinery, Cast....₩ lb 10⅛ @ 11½c
" Swaged, Cast...." 19½c
" Best Double Shear...." 17½c
" Blister, 1st quality...." 14½c
" " 2d quality...." 13 c
German Steel, Best...." 11½c
do 2d quality...." 10½c
3d quality...." 9½c
Sheet Cast Steel, 1st quality...." 17½c
" " 2d quality...." 14½c
" " 3d quality...." 12½c
File Steel, Flat and ½ Round...." 12½c
" Square and Round...." 12½c
" Mill...." 13½c
" Taper to 4 inch...." 16c
" Taper 3 and 3½ inch...." 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.
Silesian, cash....6⅞ @ 7c, gold
American "....6⅞ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per lb; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.
Banca....₩ lb 25 @ 25½c., gold
Straits....₩ lb 21½c, gold
English....₩ lb 21c., gold

CHARCOAL TIN PLATE.
I C 10x14, Prime Charcoal....11·50 @ 11·75
12x12, "....12·00
14x20, "....12·25
I X 10x14, "....13·75
12x12, "....14·25
14x20, "....14·75
D C 12⅛x17 "....11·00
D X 12⅛x17 "....13·25
For each additional X add....2·25

COKE TIN PLATE.

	Best	2d Quality.	Ordinary.
I C 10x14..	$10·25 @ 10·75	9·50 @ 10·00	9·25 @ 9·75
I C 12x12..	10·50 @ 10·75	10·00	9·25 @ 9·50
I C 14x20..	10·50 @ 11·00	10·50	9·25 @ 9·50

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20....	$10·25 @ 10·50	9·50 @ 10·00	8·50 @ 9·25
I X 14x20....	12·75		
I C 20x28....	21·00 @ 21·50	19·50 @ 2[illegible]·00	17·00 @ 18·50
I X 20x28....	26·00		
I C 20x20...	24·00		

ZINC.—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ₩ lb.
Sheet....cask 10½c
"....open 10⅝c

Old Metals.

(Dealers' Selling Price.)

Copper....@ 20
Yellow metal....14 @ 15
Brass....13 @ 14
Heavy Composition....17 @ 18
Old lead, solid....6 @ 6¼
Tea lead....5
Wrought iron....1½ @ 1⅝
Sheet iron....0⅞ @
Cast iron....1 @ 1⅛
Machinery iron....1¼ @
Zinc....5 @ 5⅛
Pewter, No. 1....17
" No. 2....10 @ 12
Spelter....5 @

Paints, Oils, etc.

Paints.
Black, lamp—Coach Painters....₩ lb 2½c
" " Ordinary....tc
" Ivory Drop, fair....1½c
" " best....26c
Black Paint, in oil....kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best....50 @ 75c
" " " " in oil....35 @ 62c
" Chinese, dry....83c
" Ultamarine....25 @ 30c
Brown, Spanish....1¼c
" Van Dyke....4c
Carmine, 40....$12 00
Green, Chrome....15 @ 27c
" " in oil....18 @ 27c
" Paris....good, 30c; best, 40c
" " in oil...." 30c " 45c
Mineral Paints....1¼ @ 4c
Orange Mineral....14½c
Red Lead, American....9⅛c
" " English....10⅜c
" Venetian (N. C.) dry....2⅛c
" " in oil....asst'd cans, 11c; kegs, 8⅛c
" Indian, dry....10c
Rose Pink....12c
Sienna American, Raw....4c
" Burnt....4⅛c
" " in oil....16 @ 26c
" Raw "....15 @ 25c
Umber, Burnt....4 @ 8c
" " in oil....16 @ 21c
" Raw....3⅛ @ 7⅛c
" " in oil....16 @ 22c
Vermillion, Chinese....
" English....1 50, gold
" Trieste....1 65 "
" American, Common....23c
White Lead, American, pure dry....10c
" " in oil....11c
White, Paris, English, prime....in bbls. 2⅛ @ 2⅜c
Yellow Ochre, French....2⅛ @ 2⅜c
" " " in oil....asst'd cans, 11c; kegs, 8⅛c
" " Vermont....in casks 1⅛c
" Chrome....17 @ 27c
" " in oil....18 @ 28c
Zinc White, American No. 1 dry....9c
" " 1, in oil....11c
" French (Paris)....11 c
" " in oil....12 c

Oils.
Linseed Raw....₩ gal. casks, 73c. bbl 74c
" Boiled...." 78c. " 79c
Whale, Crude...."
" Bleached Winter...."
Sperm, Crude...." 1·60
" Winter, unbleached...." 1·8?
" " Bleached...." 1·9?
Seal, Extra Refined...."
Lard, Pure Winter...." 1·18
" Spring...." 1·10
Cotton Seed, Crude...." 60c
" Southern Yellow....65c
" White...."
Neatsfoot, Winter....70c @ $1·10
Natural Lubricating....38c @ 40c

Sundries.
Asphaltum....9c
Benzine....₩ gal. 16c
Chalk....1⅛c
" Block....
Dryer, Patent, Am'n....ass't cans, 10⅛c.; kegs 9c
" " English...." 11c.; " 9c
Flocks....
Frostings....50c
Glue, White....33 @ 47c
" Sheet....40c
Glaziers' Points, Zinc....9c
Gum, Copal....36c
" Damar....25c
" Shellac, English....85c
" " " dark....75c
Litharge....10c
Pumice Stone, selected Lumps....4 @ 6c
" powdered....4c
Putty in bladders....3⅛c
" in bulk....3c
Rotton Stone, soft, English....8c
Spirits Turpentine....37c
Whiting, Spanish....1c

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE THICK.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$7·50	$6·75	$6·25	$5·75
11 x 14 to 16 x 24	8·50	7·75	7·25	6·50
18 x 22 to 20 x 30	10·75	9·75	8·75	7·75
15 x 36 to 24 x 30	12·25	10·75	9·00	
26 x 28 to 24 x 36	13·00	11·50	9·75	
26 x 36 to 26 x 44	14·50	13·25	10·75	
26 x 46 to 30 x 50	15·00	14·00	11·25	
30 x 52 to 30 x 54	16·00	14·50	12·00	
30 x 56 to 34 x 56	17·25	15·50	13·50	
34 x 58 to 34 x 60	18·25	17·25	15·00	
36 x 60 to 40 x 60	20·75	18·75	17·25	

DOUBLE THICK.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$12·00	$11·00	$10 00	$9·25
11 x 14 to 16 x 24	13·75	12·50	11 75	10·50
18 x 22 to 20 x 30	17·25	15·75	14·00	
15 x 36 to 24 x 30	19·75	17·25	14·50	
26 x 28 to 24 x 36	21·00	18·50	15·75	
26 x 36 to 26 x 44	23·25	21·25	17·25	
36 x 46 to 30 x 50	24·00	22·50	18·00	
30 x 52 to 30 x 54	25·75	23·25	19·25	
30 x 56 to 34 x 56	27·75	25·00	21·75	
34 x 58 to 34 x 60	29·25	27·75	24·00	
36 x 60 to 40 x 60	33·25	30·00	27·75	

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An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket
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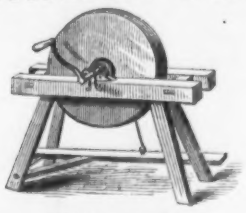

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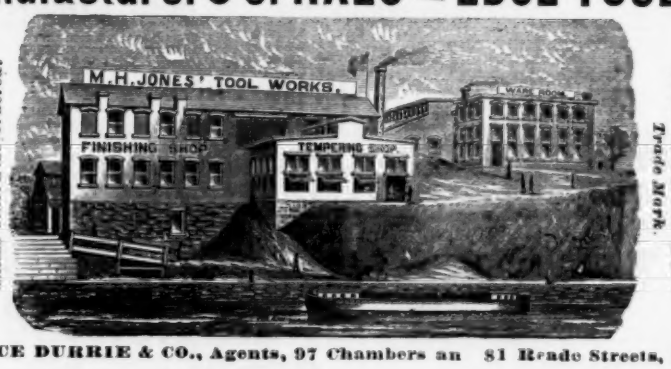

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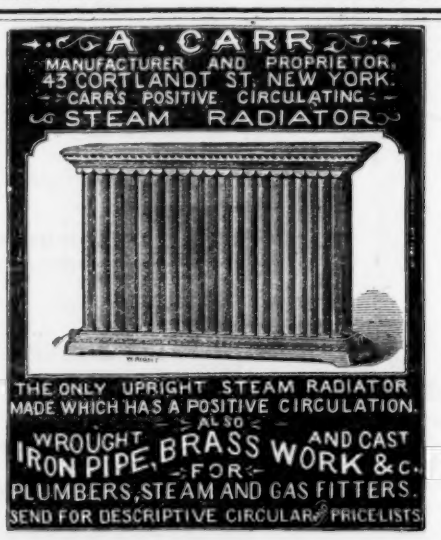

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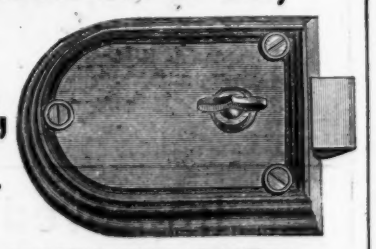

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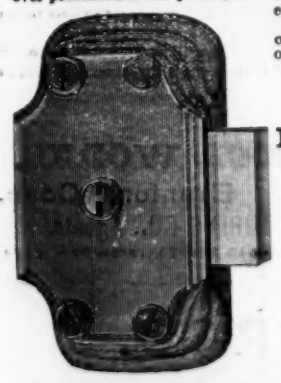

THE LOCKS ARE FITTED TO THE KEYS,

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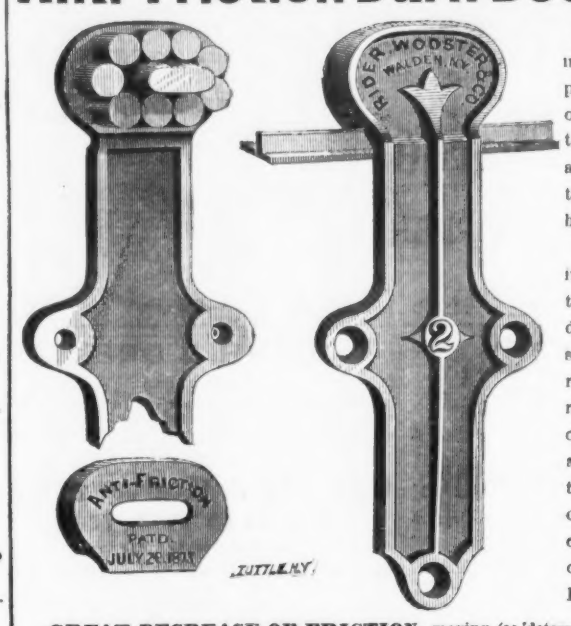

This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces Its leading advantages are:

GREAT DECREASE OF FRICTION, moving (as determined by direct experiment) with **one-fourth the power required by any other Hanger in the world.**

Great Strength. Unlimited Durability.

No Axles and Sheaves to grind and break.

All bearing surfaces harder than steel.

Thorough protection from the weather.

It will not clog with snow and ice.

It cannot run off the track.

It causes the door to run perfectly true.

It cannot get out of order.

It is compact, Simple and Beautiful in design.

This Hanger will fit any ordinary rail, but our rail is preferable, from the fact that it has a double flange at the bottom, so that the screws will not work out and allow it to rock or tip over.

No. 1 Hanger, corresponding to 4, 5 and 6 in. Sheaves or Rollers.....per pair, $1·25
No. 2 " " 6 inch and upward..... " 1·50
One Dozen Pairs in each case.—dis 30 per cent.
RAIL, with Double Flange.....per foot, 7 cents.
200 *feet in each case.*—dis 30 per cent.

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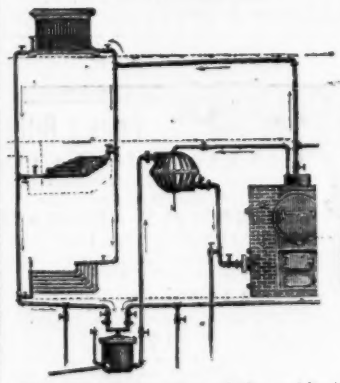

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Inventor and Patentee.

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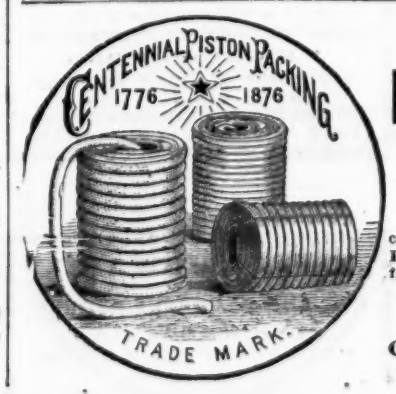

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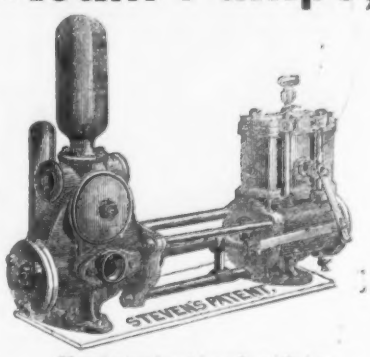

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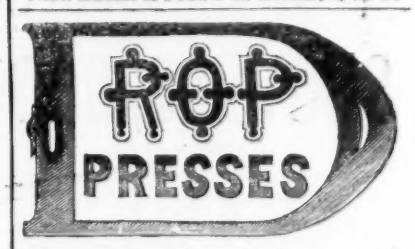

Bennett Hotchkiss and N. C. Stiles' Patent.

This Drop (which has been illustrated in this journal as of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:

First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place, to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.

Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps located under the rolls, so arranged that as the hammer descends they will freely open of themselves, but on the hammer they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any height* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

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Crown Prince ... " 12 50 @ 12 00

Augers and Auger Bits.—Pierce's Pat. Twist Bits ... dis 30 %
Douglass' & Ives' Bits ... dis 40&10 %
Connecticut Valley Auger Bits ... dis 40&10 %
Cook's Bits ... dis 40 10&10 %
Jennings' Bits ... dis 10 %
Bates' Nut Augers ... dis 40&10 %
Douglass' & Ives' Augers ... dis 40&10 %
Watrous' Ship Augers ... dis 10&15 %
Bonney's Pat. Hollow Augers ... dis 25 %
Stearns' Patent Hollow Augers ... dis 25 %

Balances.—
Landers, Frary & Clark's, Morton's, Chattillon's ... Sold on Morton's new List ... dis 50 %
Common Spring with Hook ... ℘ doz $1 38 @ 2 00

Bells.—Bevin Bros. Mfg. Co. Light Hand Bells ... dis 70 %
Common (Tissue Paper Weight) ... dis 70&10 %
Swiss Pattern Hand Bells ... dis 50 %
Connell's Door Bells ... dis 50&5 @ 50&10 %
Gt. Western & Kentucky Cow ... dis 50&10 @ 50 10&5 %

Boring Machines.—Bates' Mfg. Co., complete with augers ... dis 20 @ 25 %
Douglas Mfg. Co., complete with augers ... dis 20 @ 25 %
Common Boring Machines, no Augers ... $4 00 @ 3 75
Angular " " ... 5 00 @ 4 75

Bolts.—Eastern Carriage Bolts ... special prices
Western " " ...
Philadelphia " " ... dis 60 %
" Eagle, (Coleman's) ... dis 60 %
Wrought Shutter, Stanley ... dis 50 @ 50&10 %

Braces.—Barber's ... dis 40&5 %
Backus ... dis 50 %
Bartholomew's American Ball ... dis 10&10 @ 15&10 %
Spofford ... dis 50 %

Butts.—Cast Fast Joint, Narrow ... dis 25&10 @ 30&10 %
" " Broad ... dis 35&10 @ 40&10 %
Cast Fast Loose Joint ... dis 45&10 @ 50&10 %
" Acorn, Loose Pin ... dis 40&10 @ 45&10 %
" Mayers & Parliament ... dis 35&10 @ 40&10 %
" Acorn Jap'd ... dis 40&10 @ 45&10 %
Wrought Loose Pin ... dis 35&10 %
" Table Hinges and Back Flaps ... dis 30&10 %
" Narrow ... dis 30&10 %
" Loose Joint ... dis 35&10 %
Parker's Blind Butts, Sheperd's, Garretson's, Clark's, Lull & Porter's ... Discount 50&10 % by the case 60 %.
Garretson's Blind Butts Light No. 0, " " Lull & Porter Pattern, Cherrytree Blind Butts ... Discount 60 % By the case 60&10 %

Chains.—German Halter ... dis 20 %
" Coil ... dis 20 %
Galvanized Pump ... net 13 @ 13½c
Best Proof Coil Chain—

℘ ℔	14	10¼	9½	9	8¾	8½	8c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

By the cask, 560 lbs., ½c per lb. less. Common Chain, ½c per lb. less.

Chisels.—Socket Framing ... dis 60 @ 60&10 %
Socket Firmer ... dis 60 @ 60&10 %
Tang ... dis 40&10 @ 50 %
Beatty's Framing and Firmer ... dis 20 %

Casters.—Iron Bed ... dis 30&10 @ 40 %
Porcelain Wheel Bed ... dis 30&10 @ 40 %
Iron and Brass Wheel Plate ... dis 40 @ 40&10 %
Porcelain Wheel ... dis 50 @ 50&10 %

Clothes Wringers.—Universal ... per doz $64 00
Novelty ... " 64 00
Discount on 2 dozen lots, $2 per dozen.

Coffee Mills.—Common Box and Side ... dis 15 %
Patent Box and Side ... dis 15 %

Cutlery.—American Pocket (best) ... dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices

Drawing Knives.—Hart Mfg. Co.'s ... dis 60 %
Adjustable Handle ... dis 10 @ 15 %
Beatty ... dis 15 @ 20 %

Fry Pans.
Tinned ... dis 40 @ 45 %

℘ doz.	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No.	0	1	2	3	4	5	6	7	8

Burnished ... dis 40 @ 45 %

℘ doz.	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files ... new list
" Bastard ... "
" Taper ... "
Butcher's Mill (Advanced March 5th) ... $5 25 to £ gold
" Bastard ... 5 25 to £ gold
" Taper ... 5 25 to £ gold

Fluting Machines.
K. F. M.—4½ in. rolls, $5 50 ... dis 15 %
" —6 in. rolls, $6 50 ... dis 15 %
Mrs Knox—4 in. rolls, $5 75 ... dis 20 %
" —6 in. rolls, 7 00 ... dis 20 %

Hammers.
Yerkes & Plumb's ... dis 15 %
Hammond & Son's ... dis 15 %
Veree ... dis 20 %

Hatchets.
Beatty's ... dis 15 @ 20 %
Shingling and Half. ℘ doz. $7 00, 7 50, 7 75, 8 00; No. 1, 2, 3
Yerkes & Plumb ... dis 15 %
Shingling and Half. ℘ doz. $7 00, 7 50, 8 00, 8 50; No. 1, 2, 3, 4
Claw ... ℘ doz. $7 50, 8 00; No. 1, 2, 3

Hinges.
Strap and T, (Changed March 24) ... dis 45 %

Horse Nails.

	Nos. 6	7	8	9	10
Ausable	27	25	24	23	22
Globe	28	26	25	24	23
Brundage	26	24	23	22	21

	Nos. 5	6	7	8	9	10
Putnam	32	28	26	25	24	23

On Ausable, Globe and Brundage 1000 ℔ lots ... dis 5 %

Knobs.—Door, Mortise and Rim.
Makes in Combination ... new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim ... dis 5 %

Locks and Latches.—Rim and Mortise ... dis 45&5 %
Extra discount for cash 2 %
Till and Cupboard ... dis 25 %
American Padlocks ... dis 50 %
Scandinavian Pad Locks.

℘ doz.	$10 50	10 50	12 00	12 00	15 00	15 00	dis 15 %
No.	9	9½	10	10½	11	11½	
℘ doz.	$18 00	18 00	21 00	22 00			dis 15 %
No.	12	12½	13	13½			

Trunk Locks ... dis 5 @ 10 %
Thumb and Roggens Latches ... dis 25 %

Lanterns.—Square Candle and Oil ... dis 10 %
Globe for Oil ... dis 10 %
" " Kerosene ... dis 10 %
Tubular Lanterns ... dis 10 %

Mattocks.—Long and Short Cutter ... dis 25 %
Western Pattern ... dis 25 %
Pennsylvania Pattern ... dis 15 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets ... dis 20 %
Stebbins' Gates ... dis 60&10 @ 65&10 %
Lincoln's " ... dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum ... dis 15&10 %
Taylor's Petroleum Faucets ... dis 20&10 %
Brass Liquor Cocks ... dis 20&10 %

Meat Cutters.—Dixon's ... dis 15 %
Woodruff ... dis 15 %
Stowe ... dis 15 %
Hale's ... dis 25 %
Stuffers ... dis 10 %

Planes.—Auburn Tool Co.. "Bench" ... dis 40 %
Second Quality ... dis 50 %
Metallic Plane Co ... dis 25&5 %
Evans Pat. Circular ... net

Plumbs and Levels.
Adjustable ... dis 60&10 %
Non-Adjustable ... dis 60, 10&10 %

Plane Irons.—American ... list net
Butcher's ... gold £, $5 50

Picks.—Philadelphia ... net
Pittsburgh ... net

Rules ... dis 60, 10&10 @ 70 %

Rakes.—Cast Steel Garden ... dis 40 @ 40&5 %
Malleable Garden ... dis 40 @ 40&5 %
Wood Head Iron Teeth ... dis 40 %

Steelyards.—American Pattern ... dis 15 %

℘ doz.	$5 50	7 00	9 00	10 00	11 00	13 00
No.	50	100	150	200	250	300

English Pattern ... dis 15 %

℘ doz.	$7 00	8 67	10 67	12 67	14 67	16 67
No.	50	100	150	200	250	300

L. F. & C. Excelsior ... dis 10 %

℘ doz.	$9 00	10 00	12 00	15 00	18 00	21 00
No.	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ... ℘ doz. $10 00 net
Golden Clipper No. 10, Boxed and Sharpened ... ℘ doz $9 75 net
Green Clipper No. 5, Boxed and Sharpened ... ℘ doz $9 30 net
Common Scythes ... ℘ doz $7 50 @ 9 00

Squares.—Steel and Iron, new list ... dis 50 %

Saws.—Disston's Cross Cut ... dis 15 %
Disston's Hand ... dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list ... dis 15 %
Boynton's Lightning, new list ... dis 40 %
" Champion ... dis 45 %

Shovels and Spades.
Rowland's Plain Back, Jan. 23d ... dis 25 %
" Back Strap " ... dis 25 %
Oliver Ames & Sons ... new list dis 12½ %
Brady Shovel Co ... dis 12½&5 %

Sad Irons.—Richmond (polished face) ... per lb. 3⅝c
Richmond (polished face) ... by the cask " 3½c

Stone.—Arkansas Oil, No. 1 ... ℘ ℔ $1 38
Turkey Oil, No. 1 ... " 1 00
Washita Extra ... " 30c
" No. 1 ... " 22c
" " 2 ... " 18c
" ... " 5½c

Screws.—Iron ... new list, April 1st, 1875, dis 62½ %
brass ... dis 52½ %

Spoons.—
Plated ... dis 40&10 @ 50 %
Britannia, Boardmans (new list) ... dis 50&10 %
" Parkers (old list) ... dis 50 %
German Silver ... dis 30 %
" Light ... new list dis 35 %
Lalance & Grosjean Iron ... dis 10 %

Springs.—Gray's Door ... dis 50 @ 50&10 %
Torry's Door ... dis 50 @ 50&10 %

Stocks and Dies. ... dis 10&5 %

Stove Polish.—Gem ... ℘ gross, $5 00
Onyx ... " $5 00

Try Squares.—Winterbottom ... dis 10 @ 15 %
Stanley Rule and Level Co ... dis 45&10 %
Willis Thrall, No. 2 ... dis 30&10 %
Disston's No. 2 ... dis 40 %

Tacks, &c.—Half Weight Tacks ... dis 72½ %
" " by the case ... dis 72½&7½ %
Clout and Finishing Nails ... 7½ %
" " " by the case ... dis 7½ %

Traps.—Genuine Oneida—Newhouse list ... dis 20 %
Imitation " " ... dis 30 %

Vises.—Solid Box, currency ... ℘ ℔ net 14c

Wrenches.—Coes Genuine ... dis 40 @ 40&5 %
Coes Imitation Wrought Bar ... dis 50&30&10 %
" " Malleable Bar ... dis 60&10 %
" " (Kellogg) Malleable Bar ... dis 65&10 %
Tafts Pattern (Wrought Bar) ... dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex ... dis 25 %
" " " Improved Baxter ... dis 25 %
" " " Adjustable Fork ... dis 25 %

Wire.—No. 0 to 18 ... dis 47½ %
No. 19 to 26 ... dis 55 %
No. 27 to 36 ... dis 45 @ 47½ %
Coppered 0 to 12 ... dis 15 @ 20 %
Tinned Broom Wire ... dis 25 %
Galvanized Wire No. 0 to 18 ... dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
March 1, 1875.

Augers—Snell Mfg. Co ... dis 25 %
Bits, Auger—Snell Mfg. Co ... dis 25 %
Bells, Cow—Yaw's Genuine ... dis 30 %
Bolts—Carriage and Tire ... dis 75, 10&5 %
Braces—Bit, Spofford's Patent ... dis 70&10 %
Brads, Cut ... dis 50&7½ %
Boards—Stove, Brooks' Patent ... dis 30 %
Butts—Brass ... dis 30 %
Wrought Narrow ... dis 30&10 %
" Broad, Loose Joint ... dis 35&10 %
" Table and Back Flaps ... dis 30&10 %
Wrought Butts, Loose Pin ... dis 35&10 %
Belting—Rubber ... dis 30 @ 35 %
Leather, new list, oak tanned ... dis 20 %
Brick—Bath (box of 2 doz) Best English ... $1 25
" Rutherford" ... $1 00
Cases—Parlor Coal Hod ... dis 10 %
Chalk—White, Carpenter's ... ℘ gross, 57c
Red, Carpenter's ... " 90c
Blue, " ... " $1 00
Chisels—Firmer Socket ... dis 60&10 %
Framing Socket ... dis 60&10 %
Corner Socket Chisels ... dis 60&10 %
Slick's Carpenters' ... dis 60&10 %
Castings—Malleable ... ℘ ℔ 10c
Elbows—Corrugated ... 5, 5½, 6, 7
Charcoal ... $3 50, 4 50, 5 25, 6 50 } dis 10 %
Russia ... 7 00, 9 50, 12 00, 14 00
Files—Malschoss Bros ...
Fluters—Geneva Hand ... dis 50 %
Freezers Ice Cream—"Champion" ... ℘ doz. $15 00
Hammers—Henry W. Kip's ... dis 30 %
Hinges—Window Blind— ... dis 7½ %
Clark's ...
Shepard's and Standard ... dis 55&10 %
Wrought Strap and T ... dis 55&10 %
Hods, Coal—Plain Black and Galvanized ... dis 45 %
Funnel, Black and Galvanized ... dis 10 %
Fancy and Helmet ... dis 10 %
Hooks and Staples—Wrought ... dis 10 %
Hooks—Belt ... dis 70&10 %
Hasps and Staples—Wrought ... dis 50&10 %
Sad Irons ... dis 70&10 %
Kettles—Brass ... 3½c
Enameled ... ℘ ℔ 45c
Knives, Drawing—Oval No. 1 ... dis 50&5 %
Razor Blade ... dis 60&10 %
Lanterns "Peerless." ... No. 1, 5, 10 ... dis 50&10 %
℘ doz $26 00, $10 50, $13 75 dis 10 %
Tubular ...
" with Guards ...
Machines—Apple Paring, "Turn Table" ... 8 00 ℘ doz
Mills, Coffee—Box and Slide, common ... dis 15 %
Box Union and Eagle ... dis 15 %
" American ... dis 20 %
Nails—Clout and Finishing ... dis 7½ %
Shoe ... dis 7½ %
Horse, Ausable ... No. 5, 6, 7, 8, 9, 10 — 30, 27, 25, 24, 23, 22c
" " Pointed & Polished ... add 1c ℘ ℔
" " 1000 lbs ... dis 5 %
" Clinton ... No. 6, 7, 8, 9, 10 — 21, 19, 18, 17, 16c
Packing—Rubber ... dis 30 @ 35 %
Case lots ... dis 20 %
Paint—White Lead, U. S. Gov't ... ℘ ℔ 8½c
Rivets—Iron, Black and Tinned ... dis 25&7½ %
Rope—Manila, ½ inch and larger ... ℘ ℔ 14½c
Sisal, ½ inch and larger ... 11½c
Jute, all sizes ... 9½c
Screws—"American Screw Co"—
Flat Head, Iron ... dis 52½ %
Flat Head, Brass ... dis 52½ %
Spoons, Iron Tinned ... dis 10 %
" by the case ... dis 20 %
Plated Rogers' A No. 1 ... dis 30 %
Britannia ... dis 45&10 %
Squares—Steel and Iron ... new list 50 %
Scales—Buffalo Scale Works ... dis 25 %
Fairbanks ... dis 15 %
Stove Polish—Gem ... ℘ gross, $4 50
" Dixon's ... 6 00
Traps, Steel—Newhouse ... dis 20 %
Tacks—Half Weight Am. Iron ... dis 72½&7½ %
Vases—Palace Coal ... dis 10 %
Vises—Parallel, Buffalo ... dis 25 %
Ware—French, Tinned and Iron ... dis 25 %
Stamped and Japanned ... dis 5 %
Cast Iron Hollow ... dis 40 %
Tin Plates.—Add for each X ... 2 50
10x14, IC. Charcoal ... $12 00 | 14x20 C. terne ... $11 00
12x12, " ... 12 50 | 20x28 C. " ... 22 75
12½x17, " ... 11 00 | 20x28 X. " ... 27 25
14x20, " ... 13 00
Pig Tin—Straits ... 28c @ 29c
Bar Tin ... 30c
Solder ... No. 1, 16½c; No. 2, 15½c
Sheet Zinc—
" Lasalle" ... 570 100 ℔ casks $10 75 11 05 ℘ 100 ℔s
Sheets ... $11 25
Iron Wire—Bright and Annealed ... dis 45 %
Coppered ... dis 40 %
Tinned ... dis 20 %
Tinned Broom, Nos. 20, 21, 22 — 20c, 21c, 21c ... dis 25 %
Copper—Sheathing 14 @ 18 oz ... ℘ ℔ 31c
Planished ... ℘ ℔ 36c @ 38c
Bottoms ... ℘ ℔ 32c
Bolts ... ℘ ℔ 33c
Braziers' Sheets ... ℘ ℔ 33c
Sheet Iron.—
18 Common ... $4 30
24 Common ... 4 50
24 W. D. Wood & Co., Smooth Finish ... 5 20
Am. Russia ... A. 14c, B. 11c
Gen. Russia, No. 1 stained ... 18c
" " clean ... 19c
Galvanized ... dis 30 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal ... $11 50 @ 12 50
I. X. 10x14 Charcoal ... 14 50 @ 15 50
I. C. Terne 14x20 ... 10 50 @ 12 75
I. C. Terne 20x28 ... 21 50 @ 23 50
I. C. Continuous ... 24 00
Block Tin.—
Pig ... ℘ ℔ 27c @ 29c
Bars ... ℘ ℔ 31c
Solder.—
S. & Co ... ℘ ℔ 23c
A 1 ... ℘ ℔ 19c
Roofing ... ℘ ℔ 17c
Lead.—Pig ... ℘ ℔ 7½c
Bar ... ℘ ℔ 8½c
Copper.—
Ingot ... ℘ ℔ @ 24c
Planished ... " @ 38c
Sheathing ... " @ 33c
Sheets, 6 to 9 ℔ ... " @ 33c
" 10 to 12 ℔ ... " @ 35c
Braziers, 18 lb ... " @ 32c
Copper Bottoms ... " @ 34c
Zinc. Cask, 500 to 1000 lbs ... ℘ ℔ 10½c
Case, 100 lbs ... " 11 c
Slab ... " 7½c
Brass.—Roll, No. 26 to 30 ... ℘ ℔ 48c
Roll, No. 30 to 38 ... " 50c
Roll, No. 38 to 40 ... " 50c
Wire, No. 0 to 20 ... " 38c
" 20 to 25 ... " 40c
Babbit Metal.—Sellew & Co ... " 38c
Aliens' ... " 20c
Market ... " 12c
Antimony ... ℘ ℔ 17c
Bismuth ... ℘ ℔ $4 00
Nickel ... ℘ ℔ $3 50
Sheet Iron.—Gen. Russia ... ℘ ℔ 20c
Planished A ... ℘ ℔ 15c
" B ... " 12½c

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20	4·4c	5·5c	7·5c
22 to 24	4·6c	5·6c	7·6c
26	4·8c	5·8c	7·8c
27	5·0c	6·0c	8·0c

Galvanized Iron.—Full bundles ... dis 20 %
Nos. 18 to 20 ... 12c | No. 26 ... 14c
22 to 24 ... 13c | 27 ... 15c
Bar Steel.—Silver, ℘ ℔ 16c; Crescent, 21c.
Iron Wire ... dis 35 %
Enameled Ware ... dis 45 @ 50 %
One Piece Corrugated Elbows ... dis 10 %

Charcoal Iron.			Russia Iron.		
4½ inch	℘ doz	$2 50	4½ inch	℘ doz	$5 00
5 "	"	3 50	5 "	"	7 00
5½ "	"	4 50	5½ "	"	9 50
6 "	"	5 25	6 "	"	12 00
7 "	"	6 50	7 "	"	14 00

Lender Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	℘ doz.		℘ doz
2-inch	$1 75	2½-inch	$2 75
3-inch	2 25	3½-inch	3 25
4-inch	2 50	4½-inch	3 50

Sheet Iron Bread Pans ... ℘ ℔ 10c
American Broilers ... ℘ doz. $13 50
Tinmen's Machines ... dis 5 %
Sad Irons ... ℘ ℔. 3½c
Brass Kettles.—Ansonia ... 45c
Dog Irons ... 3½c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent. Iron, standard list assorted sizes, for large orders, c, card rate, 2 % off net.

Flat Rail (1¼x¼), punched and coun'sunk ... 4·4c ℘ ℔ net
Iron Wedges ... 4½c ℘ ℔ net
Norway Nail Rods ... 9½c ℘ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point) ... 5c ℘ ℔ net
Beetle Rings ... 8½c ℘ ℔ net
Fence Pickets—
⅝ round, bent to shape, 80c ℘ ft. of fence, less 15 % off net.

Discount off Standard List.
Carriage and Tire Bolts (new list) ... 70&10 % off net
Plow Bolts ... 30, 10&5 % off net
Stove Bolts ... 15 % off net
Machine and Square Head Bolts ... 30&10 % off net
Coach and Lag Screws ... 30&10 % off net
Bolt Ends ... 35 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in ... 7½c ℘ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in ... 6 c ℘ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅜ in ... 9 c ℘ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in ... 7 c ℘ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ℘ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ℘ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ℘ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¾c ℘ ℔ net; ⅞, ¾ in. diam. 3¾c ℘ ℔ net; ⅝ in. diam. 4c ℘ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ½c ℘ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5¼c ℘ ℔ net; 9-16 in. diam. 6½c ℘ ℔ net; ½ in. diam. 7½c ℘ ℔ net. 1c ℘ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ¾ to 1 in. diam. 9c ℘ ℔ net; ⅝ in. diam. 10c ℘ ℔ net; ½ in. diam. 12 c ℘ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to 36 in. long, 5½c ℘ ℔ net; 8, 10 & 12 in. long, 6½c ℘ ℔ net
Strap and T Hinges ... 20 & 10 % off net, delivery as customary.
For purchases amounting to $250 between May 30th and December 31st, 5 % extra off.
Screw Hitching Rings ... $5 25 ℘ 100 net
Duck Nest Tuyere Irons ... $14 50 ℘ doz net
Cast Iron Washers ... ℘ ℔ 4c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long ... ℘ ℔ 4 c net
1 to 2 in. diam. from 4 to 8 ft. long ... " 4¼c net
1 to 2 in. diam. from 1½ to 4 ft. long ... " 4½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long ... " 4¾c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long ... " 5½c net
Bridge bolts with upset ends ... ¾c. ℘ ℔ extra
Wrought iron plates, punched ... 5c. ℘ ℔ net

WAGON HARDWARE.

Wagon Box Strap Bolts—

Length	Diam.	Set of	Price
10 in. long by 7-16 at Screw End, ℘ set of 8 bolts			55c
12 "	½	8	70c
10 "	9-16	8	90c
12 "	9-16	8	90c
14 "	9-16	8	$1 00
10 "	⅝	8	1 00
12 "	⅝	8	1 00
14 "	⅝	8	1 10
16 "	⅝	8	1 20

5c ℘ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each ... 18c
" " wide track, each ... 20c
Single Tree Irons, ℘ set of four pieces ... 38c
Wrought Iron Bolster Plates, 2¾ in. wide, ℘ set ... 60c
" " 3 " ... 65c
" " 3¼ " ... 70c
" " 3½ " ... 75c
Wagon Brake Ratchets, each ... 16½c
" " " finished with guard, each ... 45 c
Wrought Hammer Straps, heavy pattern, each ... 16 c
" " light " each ... 13½c
" Rub Irons, each ... 11 c
Stay Chain Hooks, each ... 8 c
Double and Single Tree Clips, figure 1, each ... 9 c
" " " 2, each ... 10 c
" " " 3, each ... 12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 sets ... dis 25 %
Wagon Box Staples, 1½ to 2½ in. to clinch. ℘ 1000 $11 00 net
" " Bevel Box Iron, to rivet on. ℘ 1000 7 50 net
Neck Yoke Eyes, each ... 4½c net
" " with ⅝ rings, each ... 7½c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam ... ℘ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths ... " 8½c net
Wagon Rivets, 3-16 in. diam., all lengths ... " 9½c net
" & Nails, in 5 ℔ paper boxes ... ℘ ℔ 1c extra
" in 25 ℔ wood " ... " ½c extra
Wagon and Hinge Nails, ¼ in ... ℘ ℔ 17 c net
" " " 3-16 in ... " 19 c net
Double Tree Plates ... " 8½c net
Coupling " ... " 5½c net
Tongue " ... " 9 c net
Neck Yoke Plates ... " 11 c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ℘ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in. ℘ ℔ 10½c net. ¼ in., 11½c. net

DETROIT.

(*Reported by Messrs. Jewett & Root.*)

Tin Plate.—Best Charcoal
IC. 10x14 ... $12 00
IX, 10x14 ... 14 75
XX, 10x14 ... 17 50
IC. 12x12 ... 12 50
IX, 12x12 ... 15 25
IC, 14x20 ... 13 00
IX. 14x20 ... 15 75
XX. 14x20 ... 18 50
XXX. 14x20 ... 21 25
XXXX, 14x20 ... 24 00
DC, 100 Plate ... 11 50
DX, " ... 14 25
DXX, " ... 17 00
DXXX " ... 19 75
DXXXX 100 Plate ... 22 50
IX, 14x14 ... 24 00
IC, 10x14 W ... 11 50
IX, 10x14 W ... 14 25
Roofing Tin.—Best Char.
IC, Terne, 14x20 ... $11 00
IX, " 14x20 ... 13 75
IC, Terne, 20x28 ... 23 00
IX, " 20x28 ... 28 00
Coke Tin.—
IC, 10x14 Coke ... $10 25
IX, 10x14, Coke ... 13 00
IC, 14x20, " ... 11 25
Pig Tin.—
Large Pigs ... 29c
Small Pigs ... 29½c
Bars ... 30c

Solder.—No. 1 ... 16c
No. 2 ... 15c
Sheet Zinc.—
In any quantity ... 10½c
Bright Wire.
63 lbs. in bdl ... dis 40 %
Copper.—
Sheathing ... 31c
Copper Bottoms ... 32c
Planished Copper.—
Sheathing, 14x48 ... 38c
Boiler Size, No. 7 ... 40c
" " No. 8 ... 40c
" " No. 9 ... 40c
Sheet Iron.—
No. 18 Am. Com ... 4 40
No. 24 Am. Com ... 4 60
No. 26 Am. Com ... 4 90
Patent Planished Russia, Nos. 24, 25 and 26 ... 14c
Genuine Russia, No. 9, 10, 11 and 12 ... 18c
Broken bdls. ½c. extra.
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $5 85
" 21 to 24 ... 6 05
" 25 & 26 ... 6 25
" 21 to 24 Char'l ... 7 55
" 25 & 26 " ... 7 75

Steel.

THREE CLASS PRIZE MEDALS, CLASSES 1, 21, 22, First Exhibition of Industry LONDON, 1851

MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS I^ UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

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SUCCESSORS TO

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MANUFACTURERS OF

CAST, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.

BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES; Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS, HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS, FISH HOOKS, NEEDLES. &c.

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Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.

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Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.

English Spring and Plow Plate Steel. Also, manufacturer of

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"JENKS" SPRING STEEL, "MINERVA" SWEDES, AND "ANGLO" CAST SPRING STEEL;

"JENKS" TIRE, TOE CORK, SLEIGH SHOE, BLISTER, AND PLOW STEEL;

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for Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

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DOG BRAND FILES,

Unsurpassed, if equaled in quality.

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Sole Manufacturers of the CELEBRATED

CAST STEEL,

Warranted most SUPERIOR and UNSURPASSED for

TOOLS and GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND of English Steel, and

ARMITAGE'S GENUINE MOUSEHOLE ANVILS,

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Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

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STEEL,

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In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

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Particular attention is paid to quality and temper for

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Hammered and Rolled STEEL of every description

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CHROME CAST STEEL,

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(Established in 1848.)

SINGER, NIMICK & CO.

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CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

MILLER, BARR & PARKIN,

Crescent Steel Works,

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Manufacturers of all descrip^ of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.

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DUPONT'S GUNPOWDER MILLS

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70 Wall Street, NEW YORK.

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The superiority is well known of our brands Rifle Powder

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CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

Tin Plate.—

10x14, IC, Ch'l. Good.$		14x20, IX, Ch'l Best.	$15 50
10x14, IC, " Best.	12 00	14x20. IXX, " "	18 00
10x14 IX, " "	14 50	14x20. IXXX, " "	20 50
12x12, IC. " "	12 50	DC, 100 Plate, " "	12 00
12x12, IX, " "	15 00	DX, " "	14 50
14x20. IC. " "	13 00	DXX, " "	17 00
Roofing IC, Charcoal, Best		DXXX, " "	19 50
Roofing IX, Charcoal			11 50
20x28, IC, Charcoal Roofing, Com			14 00
20x28, IC, "		Fair	22 00
20x28, IC, "		Best	23 00
20x28, IX, "		"	27 50
10x14, IC, Coke Plates			10 00 @ 10 50
14x20, IC, "			10 50 @ 11 00
10x30, IC,			17 50

Block Tin.—

Large Pigs	30c	Bars	32c
Small	31c	Straits, 2c. higher.	

Zinc.—Sheet, 500 to 1000 lb. Casks 10¾c; Loose Sheets 11c; Slab Zinc or Spelter 6¾ to 7¼c

Copper.—Bottoms 35c; Sheathing 33c; Planished 38c; Boiler lengths 40c; Ingot 24c to 26c; Bolt 35c

Brazers' Sheets.—

30x60, 6 to 8 lbs.	₱ lb 38c	30x60, 15 to 100 lbs.	₱ lb 32c
30x60, 10 & 12 lbs.	" 35c		

Solder.—F. S. & Co.'s make.

Best Fine	22c
No. 1	20c
Roofing	18c
Brazers' or Spelter Solder	33c to 35c

Antimony 16c

Babbit Metal—F. S. & Co.'s—

No. 1	16c
No. 2	14c

Sheet Iron.—

	Common.	Smooth Com.	Smooth Charcoal.	Smooth Juniata.
No. 24	4¾c	6 c	7½c	9½c
25 & 26	5 c	6½c	7¾c	9¾c
27	6½c	6½c	8 c	10 c

Galvanized Iron dis 25 %

No. 16 to 20	14c	No. 27	15c
21 to 24	13c	28	16c
25 & 26	14c		

Russia Iron.—

Perfect	19c	No. 1 Stained	
		In Sheets, 1c. higher.	
American Russia.—		B	11c
A	14c	In sheets, 1c higher.	

Lead.—

Pig	7¼c	Lead Pipe, in full coils	8¼c
Bar	8¼c	Lead Pipe, when cut	8¼c
		Sheet Lead	8¼c

Wire—Bright dis 35 %; Coppered dis 30 %

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Augers.—Watrous Ship dis 10 %; L'Hommedieu Ship dis 15 %

Axes.—Forester's Favorite, Bronzed $12 00; Blue Jackets, Blue 11 5; Excelsior, Black 11 00; Chopper's Pride, Bronzed 10 50; Red Cross, Red 10 00; Red Cross, Handled 12 50; Boy's Handled Blue Jackets 12 00

Axe Handles.—Wadleigh's Oak—A (Extra) $2 50, B (No. 1) $2 00, C (No. 2) $1 50 ₱ doz

Bells, Sleigh—

Fancy Body, Patent Leather, Cloth Bound, White Metal, 30, No. 1	$1 70
Fancy Body, Patent Leather, Cloth Bound, White Metal, 36, No. 1	1 80
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 30, No. 1	2 38
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1	2 50
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 30, No. 1	3 38
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 36, No. 1	3 50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1 per pair,	50c.
Common, 6, No. 1 "	45c.

Blind Hinges.—

Orr or Washburn's per hundred sets	$9 50

Blind Fasts.—

Orr or Washburn's per hundred set	$6 00

Bolts.—Carriage, Phila., "Girard Works" dis 50&10 %

Horn x.—Best Refined ₱ lb 14c

Borers.—Angle, Backus' dis 50 %

Boring Machines.—Angle each $4 75; Common, Snell's quality each 3 75

Braces.—Barber's dis 40&5 %; Backus' dis 50 %; Spofford's dis 50 %; Amidon dis 50 %

Brackets.—Star Bronzed dis 50&10 %; Star Japanned dis 60&10 %; Store Shelf dis 35 %

Brass Faucets.—L. F. & C. dis 25

Butts.—Union Drilled Loose Joint dis 60&10 %; " " Wire Fast Joint dis 55 %; " " Acorn Loose Joint dis 60&10 %; Brass Butts dis 30 %; Wrought Table Butts and Back Flaps dis 30&10 %; Wrought Narrow Butts dis 30&10 %

Can Openers.—Sprague's dis 50 %; No. 1, Iron Handle $4 00; No. 2, Wood Handle 4 50

Cartridges.—"U. S. Cartridge Co." dis 50&10 %

Chisels.—"Buck Bros.' Shank Goods" add 20 @ 22½ %; Socket add 22½ @ 25 %

Churns.—Lightning—

Redheffer patent.	3	4	5	6 gall
per doz	$22 60	$27 00	$31 50	$36 00

Coal Hods dis 35 %

Fancy Japanned, No. 1, 15 in., $8·00; 5, 16 in., $9·00; 6, 17 in., $10·00.

Fancy Galvanized, No. 4, 15 in., $11·50; 5, 16 in., $13·00; 6, 17 in., $14·00.

Perfection, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.

Perfection, Galv'd, No. 4, 15 in., $15·00; 5, 16 in., $16·00; 6, 17 in., $17·00.

Morning Glory, Jap'd, No. 4, 15 in., $12·00; 5, 16 in., $13·00; 6, 17 in., $14·00.

Morning Glory, Galv'd, No. 4, 15 in., $15·00; No. 5, 16 in., $16·00; No. 6, 17 in., $17·00.

Compasses and Dividers.—Bemis' dis 35 %; P. S. & W. dis 25 %

Cordage.—Manilla (usual trade dis.) ₱ lb, 14½c; American Tarred Hemp Lath Yarn ₱ lb, 10c

Corn Hooks per doz $2·75

Cow Ties dis 10 %

No. 30, Open Ring,	3 foot,	No. 6,	with Toggle	$3·70
No. 35,	" 3	" No. 6,	" Snap	3·90
No. 40,	" 3½	" No. 5,	" Toggle	4·23
No. 45,	" 3½	" No. 5,	" Snap	4·40
No. 50,	" 4	" No. 4,	" Toggle	4·85
No. 55,	" 4	" No. 6,	" Snap	5·00
No. 60,	" 4½	" No. 3,	" Toggle	5·60
No. 65,	" 4½	" No. 3,	" Snap	5·80

Crow Bars.—Iron. Steel Points ₱ lb, 5½c; "Sweet" Steel Bars ₱ lb 11c; Brown's Steel Bars ₱ lb 10c; K. P. & Co. Extra Drill Steel ₱ lb 15c

Dividers.—Cook's Nickel Plated dis 15 %

Door Springs.—Stimson's Patent.—

No. 1, Light inside doors,	$12·00		dis 25 %
No. 8, " outside "	$18·00		dis 25 %
Torrey's			$4·00

Egg Beaters.—Lightning, Redheffer pat. 1 qt., 2 qts.

per doz	$8 00	$12 00

Emery.—Alden ₱ lb 6½c; Wellington Mills ₱ lb 10c

Files.—Earl Smith & Co.'s English $5 to £ gold; American $5 to £ currency, less 12½ %; Nicholson new net list; Wheeler, Madden & Clemson £5 net; Stubb's Tapers, genuine, 3 in., $1·30; 3½, $1·62; 4, $1·88; 4½, $2·13; 5, $2·50.

Funnel Irons.—

$2·50	2·50	2·50	3·25	per doz
5,	5½,	6,	7	inch.
Deep Flange.—$3·50	$3·75	4·00		
5,	5½,	6 inch.		

Hammers.—Maydole dis 5 %; M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $8·75; " " " " " bell face, No. 1, $11; 1½, $9·75.

Hangers & Rollers.—Novelty dis 30 %; Anti-Friction $1 25 per pair—dis 30 %

Hatchets.—Underhill Edge Tool Co. dis 15 %; C. F. Dowse, warranted Cast Steel—Shingling, 0, $4·75; 1, $3·25; 2, $5·75; Claw, 1, 5·75; 2, 6·25; Lathing, 1, $5·50; Axe Pattern, 1, $7·00; 2, 7·50; Broad, 0, $5·25; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75.

Hinges.—Strap and T, Stanley Works unsettled; Plate, Loose and Fast Joint ₱ lb 6c; Wrought Screw Hook ₱ lb 6½c

Lanterns.—Tubular No. 0 $9·50; Guarded, No. 74, (with kerosene oil and candle burners) 6·25

Lead.—Sheet and Pipe 9c—less 10 %

Locks.—Norwalk Lock Co. dis 45&5 %

Mattocks.—

K. P. & Co., axe finish, long cutter	$13 00	dis 10 %
Snort cutter	12 75	dis 10 %

Meat Cutters.—"Miles's" Challenge dis. 20 %; No. 1, $22·00; 2, $30·00; 3, $40·00.

Metal.—Babbitt, No. 1, 25c; 2, 25c; 5, 16c; 4, 15c ₱ lb

Nails.—10d and larger—dis 15c 100 keg lots $3 50

Nail Pullers.—Little Giant—Small per doz., $22·00; Little Giant—Large " 30·00

Padlocks.—Wilcox dis 50&5 %; All Brass, 2¾ inch, 2 keys, job lot $9 00

Paper.—Tar'd Sheathing ₱ lb 2 c; Dry Sheathing " 3½c; " " "Beaver Brand" Rosin Sized " 4½c; Tar'd " " " " 5½c; Felt " " " " 4½c

Picks.—

K. P. & Co. Axe Finish	₱ doz 5 to 6	$8·50; 6 to 7 $9·00
" " Solid Eyes	5 to 6	6 to 7
	$9 00	$9 50

Pins.—Universal Hat and Coat all wood—½ in. ₱ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 15 %

Potato Diggers.—"Partridge," 6 square tine ₱ doz $12 00; Shumway & Co., 6 round tine ₱ doz 9 00

Pulleys.—Axle ..1¼ No. 15, 31c; 1¼ No. 18, 33c; 1¼ No. 28, 42c; 2 No. 29, 49c. Nashua, Bronzed Face 1¼, 80c; 2, 90c; Steel Axle " " 2, $1·00

Pulley Blocks.—"Best Boston Make" net

Common Strapped Blocks—

4	5	6	7	inch.	
Single, 75c.	85c.	$1·00	$1·13	each.	
Double, $1·00	1·12	1·25	1·60	"	

Inside Iron Strapped Blocks—

5	6	7	8	7	10	inch.
Single, $1·00	1·13	1·38	2·00	2·25	1·75	each.
Double, 1·88	2·00	2·62	3·63	4·00	5·00	"

Inside Iron Strapped Blocks, with Patent Roller Bushings—

5	6	7	8	9	10	inch.
Single, $1·25	1·50	1·65	2·50	2·65	3 50	each.
Double, 2·50	3·00	3·38	4·63	5·00	6·50	"

Plated Ware.—Rogers bros. dis 50 %

Plumb & Levels.—"Davis" Pat. Adjustable—No. 1, Iron and Wood Center Levels dis 50 %; No. 2, First Quality Levels dis 60&10 %; No. 3, Iron Pocket " dis 35 %; No. 4, Level and Plumb Glasses dis 60&10 %; No. 5, Iron Pocket Levels, per square and straight edge dis 50&10 %; No. 6, Improved Iron Bench Planes dis 40&10 %

Pocket Knives.—Conn. Cutlery Co. new net list; American Shear Co. dis 33⅓ %

Rail Barn Door.—For Novelty and Anti-Friction Hangers per foot 7c.. dis 50 %

Rivets.—Black dis 25 %; Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8,

12	13	14	15	16c	₱ lb net

Rubber Moldings.—"Harmon's" dis 10 %; No. 2, for Windows per foot, 5c; No. 3, for Doors per foot, 10c; No. 1, " per foot, 12c

Sad Irons.—Bliss & Drake ₱ lb 3¾

Sand Paper—0 to 2, $4·25; 2 to 3, $4·75 dis 10 %

Saws.—*Hand and Panel*—Wheeler, Madden & Clemson's, same list as "Diston's" dis. 15 %; Disston's dis. 12½ %

Cross Cut—Wheeler, Madden & Clemson X Cuts per ft., 37c; " " " "Star" X Cuts, " 60c; " " " Champion X Cut, " 50c; " " " One Man X Cut, each, $2·25; Boynton's genuine Lightning X Cut, per ft., 60c; " " One Man X Cut, each, $2·25; Circular—Wheeler, Madden & Clemson's dis. 25 %; Mill— dis. 25 %

Screws.—American Screw Co. revised list dis 52½ %; Aiken's dis 50&10 %

Scythe Stones.—"Willoughby Lake," first quality ₱ gross $6·50; " " second quality " 3·00

Shovels.—O. Ames new list dis 12½ %; M. B. & D. new list dis 12½ %; Snow, Malleable Iron Tip, D Handle—Agents for New England $6 50; Snow, Malleable Iron Tip, long Handle—Agents for New England 5·50

Sifters.—Coal, Rice, &c. $12 00

Spading Forks.—M. & E. dis 25 %

Stone Pickers.—"Partridge," original ₱ doz $15 00

Tools.—Aiken's Pattern, 20 in set; Parr's, $8·00 per doz

Traps.—Onelda dis 20 %; Blake's dis 30 %

Vises.—B. P. & Co.'s Solid Box Blacksmith ₱ lb 12c; Parker's Parallel dis 10 %; Backus dis 25 %; "Howards." Parallel dis 20 %

Wardrobe Hooks.—Wire to drive ₱ gross $1 00

Weather Strips.—"Harmon's" per doz $5, dis 10 %

Weights.—Wingow Weights ₱ lb 2½c

Wedges—Axe ₱ doz 38c

Wire.—Eureka, in spools, No. 28 to 40 assorted ₱ gross $3 50

Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black ₱ ft 5½c

Wrenches.—Genuine Wrenches, G. A. Coes dis 40&5 %; Walton dis 50 %

Wringers.—

Novelty and Universal	Tub No. 2	Less than 2 doz.	$64 00
		2 doz or more,	62 00
Bench A	less than 2 doz	$82 00; 2 doz or more	$80 00
" B	" " "	90 00 " "	88 00
" C	" " "	108 00 " "	105 00

Eureka per doz $58 00

Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 33⅓ %

Boston Metal Market.

(Corrected by Fuller, Dana & Fisk.)

Tin Plates.—₱ box

I. C. Char. 10x14 @	$9·25
I. C. Coke 10x14	9 00
Char. Roof. IC, 14x20, 10 lb	7 75
Coke " IC, 14x20, 10 lb	7 25

Pig Tin.—₱ lb

Banca	21c
Straits	24¾c
English	24¾c

Zinc.—Sheet ₱ lb 10¾c

Iron.—Sheet Iron, Russia " 17c; Sheet Iron, English " 5 c; " " American Refined " 5¾c; " " Galvanized " 10c; Plate Iron " 5¾c; Swedish and Norway Bar Iron, gold ₱ ton, $120 00; " " Shapes, gold 125 00; Norway Nail Rods, first quality, gold 145 00; " " second " " 135 00; Best Refined Bar Iron 60 50; The "Burden Best" Iron 100 00; American Pig Iron, Foundry, No. 1 80 00; " " No. 2 75 00; " " Gray Forge 72 00

Copper.—

Sheathing	30c
Bolt	32c
Ingot	22c

Lead.—

Pig	7¼c
Sheet & Pipe	8½c

Spelter. ₱ lb 7¼c

Antimony. ₱ lb 13c

Scotch Pig Iron ₱ ton 36 50 @ 40 50; Wrought Scrap Iron 34 00

Steel.—

₱ lb		German	10c
Eng. Tool	18c	Spring	8 c
American Tool	14½c	Tire	6½c
" Mach	10c	Sleigh Shoe	4¾c
Passemer	7½c	Toe Calk	8 c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror ₱ doz, $7 75; Hudson's Rotary " 7 75

Axes.—Wm. Mann's, Red Warrior ₱ doz $11 50; Wm. Mann's, W. Stewart's 11 00; " C. Marshall 10 50; " Handled $5 extra; " Double Bitted 2 50; H. L. B. & Co.'s, L. & Co. 11 50; " Pioneer 13 00; " James & Co. 11 00; Hunt's 12 00

Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles dis 10 & 5 %; Common Axles (Fat. Lubricating), 1¾ inch and upward ₱ lb, 6½c; do. less than 1¾ inch " 7 c.

Bellows.—Best St. Louis make, 20c ₱ in. dis 20&2½ %

Bells.—Troy, Church, School and Farm Bells ₱ lb 42c; "Improved Amalgam Bronzed," 15 in., $3·00; 17 in., $4·00; 19 in., $6·00 dis 10 %

Belting.—"Boston Belting Co.'s" Rubber dis 30 %; "Bradford & Sharp's" Oak-Tanned Leather dis 20 %

Bolts.—Arms, Bell & Co.'s Carriage and Tire, dis 75&5 %; Arms, Bell & Co.'s Machine dis 30 %

Butts.—Western Butt Co.'s—Narrow Fast Joint dis 33 %; Broad Fast Joint dis 50 %; " Loose " dis 65 %; Reversible dis 60 %; " Japanned and Silver Tipped dis 55 %; Arms, Bell & Co.'s Machine dis 30 %; Loose Joint " Acorn " " " dis 60 %; Wheeling Hinge Co.'s W't Fast Joint Nar. dis 35&10 %; " " " Broad. dis 35&10 %; " " Loose Joint dis 35&10 %; " " Reversible dis 35&10 %; " " Table & B'k Flaps. 30&10 %

Churns.—Julian, No. 2, $7·00; No. 3, $7·50; No. 4, $8·50 dis 20 %

Corn Knives.—Dunn Edge Tool Co.'s Clip 5 75; Seymour Mfg. Co.'s Solid Steel Back 5 00

Corn Shellers.—Sandwich Mfg. Co.'s—Power Shellers dis 10 %; Hand Shellers Special rates

Cotton Gins.—Dubois Patent dis 10 %

Crow Bars.—Steel Pointed ₱ lb 6½c

Drag Saw Machines.—Culver's Iron Drag Saw dis 10 %; Robinson's Patent Sweepstakes Drag Saw dis 10 %

Fanning Mills.—Nash & Cutt's dis 10 %

Feed Cutters.—Improved Burdick National dis 15 %; Sanford No. 1, $12 00; No. 2, $8 75 net

Files.—Black Diamond, Mill $5·00 £ currency; " Bastard 5·00 £ currency; " Taper 5·00 £ currency

Forges.—Keystone Portable Forge Co.'s dis 12½ %

Forks and Hoes.—Auburn Mfg. Co.'s Hay and Manure Forks dis 33⅓ %; " " Handled Hoes dis 30&5 %

Garden Seed Drills and Wheel Hoes.—Allen's Double Wheel Hoe dis 15 %; " Planet Drill, Nos. 2 and 3 dis 15 %; " Combined Drill and Wheel Hoe dis 15 %

Grinding Mills.—French Burr Mills net list; Challenge Feed Mills dis 30 %; Sedgebeer's Nonpareil Mills dis 10 %; Osage Corn and Cob Mill dis 20 %

Hammers.—Masons' Hammers ₱ lb 25c; Smiths' Hand 23c

Handles.—No. 1 Fork, Hoe and Rake dis 20 %; No. 2 Fork, Hoe and Rake dis 40 %

Harrow Teeth.—1 inch iron ₱ lb 4½c; ⅞ and ¾ inch iron " 4¾c; Barbed or Headed ½c extra

Hay and Cotton Presses.—Dederick's Railroad dis 5 %; " Perpetual net

Hay Knives.—Dunn Edge Tool Co.'s ₱ doz $15 00—dis 15&5 %; Lightning (Weymouth's Patent) ₱ doz $20 00

Hinges.—Wheeling Hinge Co.'s Strap & T. dis 40&10 %

Horse Hay Fork.—Neills' Harpoon dis 25 %

Horse Nails.—National Patent Pointed 20c rates; National Patent Pointed, extra finished 25c "

Horse Powers.—Pitts or Carey's Patent dis 10 %; Wheeler's Railway dis 10 %; Sandwich Lever dis 10 %

Horse Rasps.—Heller Bros. dis 45 %; "Black Diamond" $5·00 to the £ currency

Horse Shoes.—Rhode Island (Perkin's Pattern) ₱ keg, $6 25; " Mule " 7 25; " Trotting Shoes " 6 25; Tredegar Horse per keg $6 25; " Mule per keg 7·25

Hose.—Boston Belting Co.'s Rubber Medium Sizes dis 25&5 %; " " " ¾x2 inch dis 25&15 %

Ice Tools.—W. T. Wood & Co.'s Saws new list net; W. T. Wood & Co.'s Chest Hatchets new list net; " " Axes new list net; " " Loading Tongs new list net; " " Medium, Small and Family Tongs new list net; " " Chisels, Hooks and Grapples new list net

Lawn Mowers.—Archimedean dis 20&5 %; Charter Oak dis 20 %

Mattocks and Grub Hoes.—Klein, Logan & Co.'s Mattocks ₱ doz $14 75 @ 15 25; " Grub Hoes, oval eye " 10 75 @ 12 00

Money Drawers.—Pierpont & Co.'s Excelsior per doz $40·00 net

Nails.—Wheeling $3 30 rates

Packing.—Boston Belting Co.'s Rubber, Plain dis 30 %; Boston Belting Co.'s Rubber, Pure dis 25&5 %; " " No. 2 Plain dis 40 %; " " Round and Square dis 10&10 %

Picks.—Klein, Logan & Co.'s Railroad and Clay ₱ doz $10 50 @ 11 75; Klein, Logan & Co.'s Coal " 8 00 @ 9 00; " " Pick 12 00; " " Stone " 15 00; " " Tamping " 17 50

Plows.—Avery's Cast and Steel dis 15 %; Collins Cast Cast Steel new list net; Pekin Steel new list net

Post Hole Augers.—Clark's Patent No. 1, ₱ doz. $7; No. 2, $8; No. 3, $32 dis 30 %

Pulleys.—5 inch per doz $4·25 net; 4 inch per doz 3·25 net; Nellis' Patent new list dis 10 %

Rakes.—Paddock's Premium Sulky $30 00 net; St. Louis Revolving 14 tooth 5 50 net; " 16 " 6 00 net; Hand Hay Rake dis 10 %

Reaper Knives and Sections.—Geo. Barnes & Co.'s Knives dis 20&5 %; " " Sections dis 25 %

Road Scrapers.—Steel dis 25 %; Cast Iron dis 10&2½ %

Sad Irons.—Monitor Brand, Silver Polished ₱ lb 4c

Sash Weights.—Standard Solid Eyes ₱ lb 3¼c

Saws.—Hubbard Lippincott, Bakewell & Co.'s dis 10 %; Branch, Crooks & Co.'s dis 15 %

Scythes.—Dunn Edge Tool Co.'s new list dis 20&5 %

Scythe Stones.—No. 1 Ind'n Pond ₱ gr's, $7 00; Extra Indian Pond " 7 50; Premium " 10 50; Diamond Grit " 13 00 } dis 25

Shovels and Spades.—Myers & Armor dis 15 %; O. Ames & Son dis 5 %; Grain Scoops, (Pat. Corrugated Straps) M. & A. dis 15 %; " " T. Rowland's dis 15 %; " " O. Ames & Son dis 5 %

Sledges.—Smith's Stone or Coal Sledges—Steel Face Polished ₱ lb 15c; Solid Cast Steel " 25c

Spaths and Cradles.—Seymour Mfg. Co.'s dis 20 %

Springs.—Cleveland Spring Co.'s—Carriage and Express dis 12½ %; Blue Seat Springs dis 15 %

Thimble Skeins.—Pump & Skein Co.'s dis 60 %

Vises.—Solid Box ₱ lb 16c; Wilson Mfg. Co.'s dis 15 %

Wheelbarrows.—Railroad & Garden new list net

Wrenches.—Coes' Genuine dis 33&10 %; Coes' Pattern dis 50 %

Wagons.—Whitewater Farm Wagons—Thimble Skein No. 3, 3 6; 3¼, $90; 3¾, $81; Iron Axle No. 1½, $90; 1¾, $93; 1¼, $99

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Selway & Co.)

Tin Plate.

IC, 10x14, Char	12 00 @ 12 00	IX, continuous, 20 in. x 200 ft	
IX, 10x14, "	14 50		
IC, 12x12, "	12 50	IC, 10x14, best Coke	$11 50
IX, 12x12, "	15 00	IC, 10x14, good Coke	11 00
IC, 14x20, "	13 00	IC, 10x20	12 00
IX, 14x20, "	15 50	IC, 14x20	11 50
IC, 14x20, Terne	14 00	IC, 20x28	23 00 @ 24 00
IX, 20x28, "	22 00 @ 24 00	IC, 14x56, Coke Lead	9 c
IC, continuous 20 in. x 200 ft	26 00 @ 27 00	IC, 10x14, punch'd for Safes	10 00

Block Tin.

Large Pigs	Straits	30c	Bars 32c
Small "	English	31c	

Sheet Zinc.

Casks	₱ lb 10¼c	Sheet	₱ lb 11¼c

Solder.

No. 1, Refined, in bars or plate	17c
No. 2, " " "	16c
Pig Lead	7¼c

Sheet Copper.—18 to 100 lbs. Sheets 30x60 32c; 14 to 16 lbs., Sheets 30x60 32c; 10 to 12 lbs., " and 30x72 35c; 6 to 9 lbs., " 38c; Tinned, 14 and 16 oz. 14x48 38c; Planished, 14 and 16 oz. 14x48 38c; " No. 7, 8 and 9 40c; Copper Bottoms 38c

Sheet Iron.—

	Com'n.	Sm'th.	Char'l.	Jun'ta
No. 16 to 20	4½c	5 c	7c	9½c
No. 22 to 24	4½c	5 c		
No. 25	4¾c	5¼c	7½c	9¾c
No. 26	5 c	5¼c	7½c	10c

Galvanized Iron dis 22½ %; **Iron Rivets** dis 25 %; **Iron Wire** dis 35 %; **Coppered Market Wire** dis 30 %; **Copper Rivets and Burs** dis 25 %; **Russia Iron.**—Nos. 9, 10, 11 and 12 ₱ lb 20c; No. 1 stained ₱ lb 18c; Imitation Russia ₱ lb 15c; **Retinned Stamped Ware** 11c

TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

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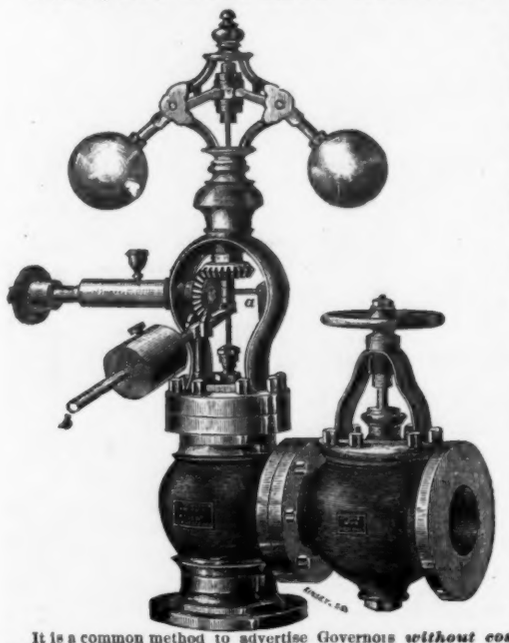
February 10, 1875. **REDUCED PRICE LIST OF THE**

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Black, Finished or Portable, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in inches.	Price, Black.	Price, Bright Finish.	Price, Portable.	Price of Lever Attachment for altering speed.	Price of Stop Valve.
¼	18·00	20·00	17·00	..	..
⅜	20·00	22·00	19·00	..	..
1	24·00	27·00	22·00	2·00	5·25
1¼	29·00	33·00	27·00	2·25	6·64
1½	34·00	38·00	31·00	2·50	8·50
2	41·00	46·00	38·00	2·75	11·50
2¼	47·00	54·00	..	3·25	16·00
2½	50·00	57·00	47·00	3·50	17·00
2¾	55·00	62·00		3·75	19·00
3	62·00	70·00	No Larger Portable made than 2½ in.	4·25	22·00
3½	71·00	80·00		4·50	27·00
4	81·00	92·00		5·00	32·00
4½	91·00	103·00		5·50	37·00
5	103·00	114·00		6·00	42·00
5½	116·00	129·00		6·50	48·00
6	134·00	148·00		7·00	55·00
7	160·00	176·00		8·00	69·00
8	199·00	219·00		9·00	83·00
9	230·00	255·00		10·00	..

No Charge for Boxing & Cartage.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

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Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

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New Pattern with Important Improvements & Abundant Strength

For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS It is extensively in use in MINING operations, for crushing

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Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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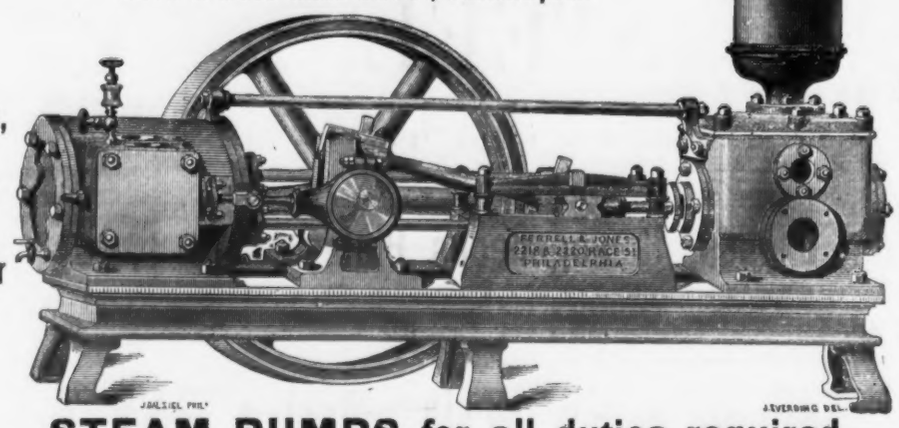

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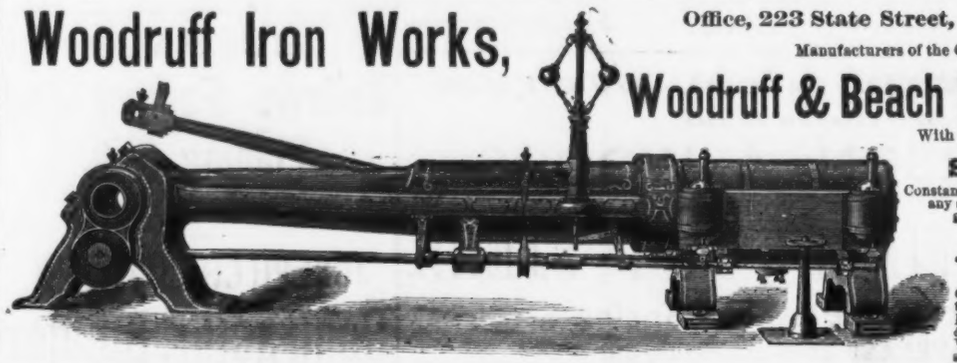

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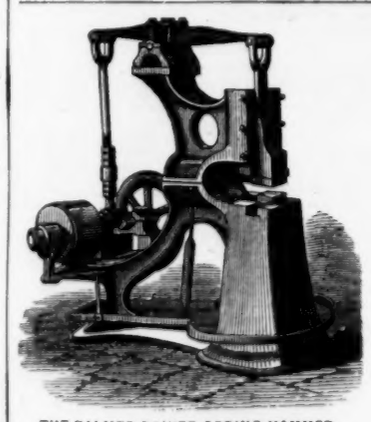

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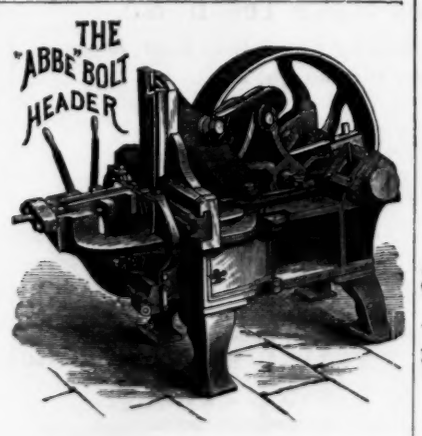

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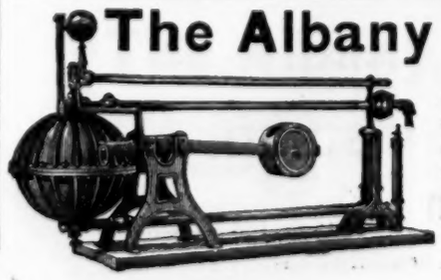

This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

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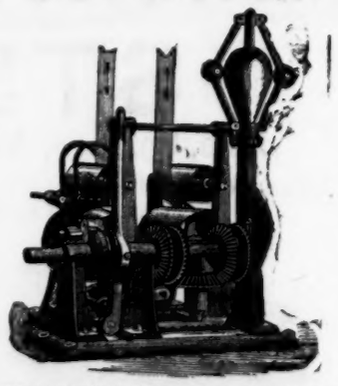

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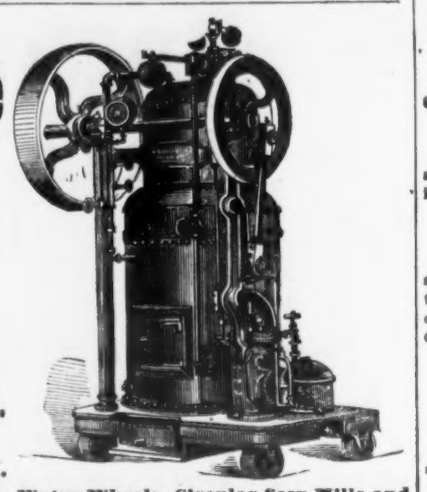

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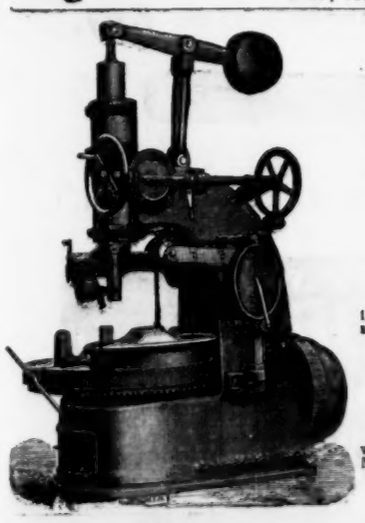

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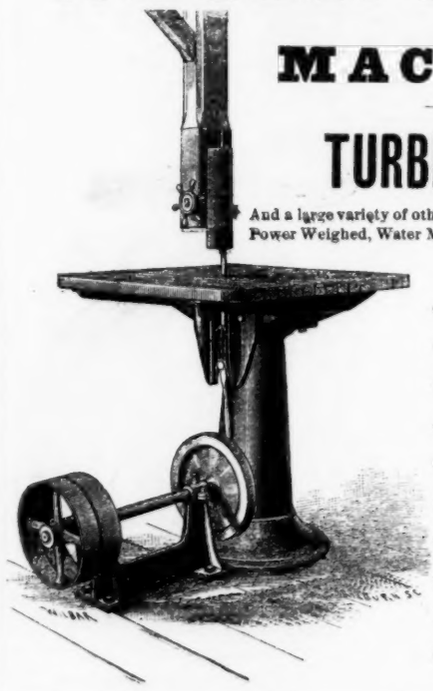

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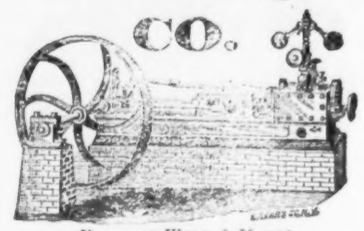

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The best and Most Complete Assortment in the Market.

These Engines have always maintained the very highest standard of excellence. We make the manufacture of Engines, Boilers and Saw Mills a specialty. We have the largest and most complete works in the country, with machinery specially adapted to the work.

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Machinists' Tools.

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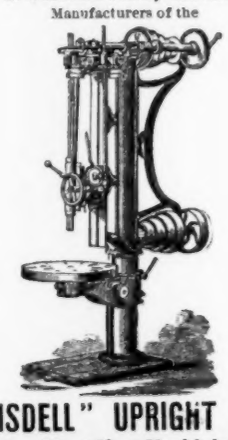
Manufacturers of the



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JOHNSON'S PATENT UNIVERSAL
LATHE CHUCK.

We invite attention to the superior construction of this chuck. Its working parts are **absolutely protected from dirt and chips.** It is strong, compact and durable, and will hold the greatest variety of work, as the jaw are adjustable with range be full diam e ter of the chuck. For Price List address,

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Having compiled a complete list of the **Hardware Dealers** in the United States, expressly for addressing circulars, I am prepared to receive orders for addressing **ENVELOPES, CIRCULARS, &c.** The printed address is cut from the list and stamped upon the envelope or wrapper, thus enabling me to address a great number in a short space of time, and at rates far below the prices usually paid for this work. It answers all purposes, and can be done for one-third the expense of addressing by hand. My list contains names of over 4000 dealers, each State, city and town therein, being compiled separately. Wholesale Dealers and Manufacturing Co.'s, whose custom it is to send out circulars, price lists, &c., to the trade throughout the States cannot fail to find my list and style of addressing a great advantage to them, as it is a great saving of both time and expense. It has been tried by a large number in the trade, some of whose names appear at the bottom of this circular and to any of whom I would most respectfully refer. My rate for addressing is $2·50 per M. Envelopes, &c., sent to the address below, will receive prompt attention, and will be addressed and returned at once, or envelopes, &c., will be furnished at market prices. For further information, address,

CHAS. B. SMITH, No. 115 Broad St., N. Y.

REFERENCES.

Union Nut Co., 78 Beekman St., L. Boardman & Son, 84 Chambers St., Millers Falls Co., 79 Beekman St., E. M. Boynton, 80 Beekman St., Yale Lock Mfg. Co., N. Y.

P. S.—Copies of my list will be forwarded to any address throughout the U. S. upon receipt of $2·00.

NEW YORK, February 26, 1874.

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OF VARIOUS GRADES.

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CAST SPRING AND PLOW STEEL.
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BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.

NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

SUCCESS

BEYOND COMPETITION.

Nellis' Patent Cotton Tie.

This TIE meet the approval of every Planter and Factor that has given it a trial. A single trial at the Press or Compress affirms its strength, merits and advantages over any in the market. We are prepared to supply the trade at market prices. Orders and Sample Orders respectfully solicited.

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ESTABLISHED 1840.

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Each mouse caught resets the Trap for another.

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Safe, Economical, Indestructible.

Known as the best Lubricator 200 years ago, but nobody has been heretofore prepared to furnish it in a perfectly pure state to the trade. *FIFTY CENTS PER POUND.*

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AND OTHER

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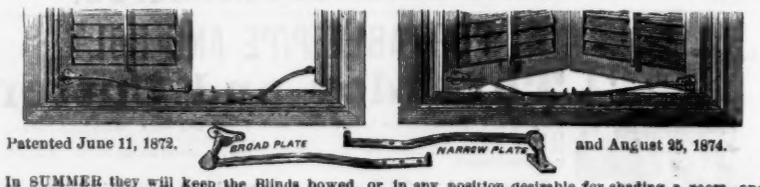
Carriage Bolts made from Best Square Iron, a Specialty.

The "Domestic" Blind Adjusters.

Hold the Blinds in any Position,

And require no Hooks or Catches on the House.



Patented June 11, 1872. and August 25, 1874.

In SUMMER they will keep the Blinds bowed, or in any position desirable for shading a room, and in WINTER they enable them to be opened or closed *without reaching out of the window*, by simply raising the sash a few inches.

INVALUABLE FOR BAY WINDOWS.

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For Water, Gas and Steam.

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